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INTRODUCTION TO QUANTUM MEDICINE

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Now Prof.Mkrtchian is one of the leading medical scientists working out the foundation of the Quantum Medicine and the pioneer of its application to the cancer problem.
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S P Sit'ko is the Director of Scientific Research Center for Physics of the Alive and Microwave Resonance Therapy (Kiev, Ukraine) where he has created a scientific school He is the Editor-in-Chief of International journal "Physics of the Alive" and the Chairman of Problem Committee for Quantum Medicine of the Ministry for Health of Ukraine. Prof Sit'ko is the President of All-Ukrainian Medical Physics Association.
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Introduction to Quantum Medicine

The monograph is devoted to the description of fundamental physical foundations of quantum medicine and the applied aspects of this principally new direction in the context of traditional medicine problems and achievements.

The decade experience of the methods of microwave resonance therapy elaborated by the collective of research fellows and consultants of SRC "Vidhuk" introduction in different clinics of Ukraine, also the former USSR is summarized here.

The results of treatment of the diseases of digestive organs, blood circulation, respiration, osteo-articular, nervous systems, mental deviations, malignant neoplasias are described. In all necessary cases the references on the performers of research are presented.

The monograph is addressed to physicians, biologists, also researchers in area of physics of the alive.

Монографію присвячено розгляду фундаментальних фізичних засад квантової медицини та прикладним аспектам цього принципово нового напрямку в контексті проблем і досягнень традиційної медицини.

Узагальнено 10-річний досвід впровадження методик мікрохвильової резонансної терапії, які створено колективом співробітників і консультантів МНІЦ "Відгук", у різних клініках України, а також колишнього Радянського Союзу.

Описано результати лікування органів травлення, кровообігу, дихання, руху, нервової системи, психічних відхилень, злоякісних новоутворень. У всіх необхідних випадках даються посилання на виконавців.

Монографію розраховано на медиків, біологів, біофізиків, а також дослідників у галузі фізики живого.

Editor-in Chief — Prof.I.S.Dobronravova

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Editor's Address

The book you are holding in your hands is somewhat unusual. That is not the only point that its first Chapter is written by a physicist while the others by a physician: interdisciplinarity is a commonplace in the end of our century. For example, biophysics has in fact acquired the status of an independent discipline.

However, Physics of the Alive considered by Prof. S.P. Sit'ko as a theoretical basis of Quantum Medicine (see Chapter I) makes the next, even in comparison with modern biophysics, step in the physical knowledge of living nature. Up to now, when studying as far as possible the living organism as, say, a system of mechanical levers or a solid, bearing Davydov's solitons, physicists made no distinction between the animate and inanimate. It seemed as if physics tried to find out its own subject of inquiry — e.g., a structural base common for all substances or manifestation of physical laws — in the existence of the alive and to treat it by using physical methods. This held the universality of physical laws but left aside the life specificity. The latter was pointed out only as a sort of singularity as compared with the inanimate: e.g., strange stability of extremely thin cellular membranes withstanding high voltage, etc.

No wonder that so long as physics ignored life's inherent and fundamental features the life itself was not able to become a subject of physical knowledge. It is without these features, namely the integrity of living objects and their ability to self-organize, that we cannot imagine the phenomenon of life. True, in the beginning of our century quantum mechanics stated the problem of irreducibility of properties of an integral quantum-mechanic system to those of its components. However, up to the recent decades the quantum-mechanic phe-

nomena were considered as microscopic events, with no relation to the integrity of macroscopic living organisms.

Treating self-organization of complex systems as a subject of exact science, the modern scientific revolution has offered ample and essentially new scope for physical knowledge of the alive. On the one hand, elucidation of the physical basis of self-organization as a spontaneous complication has eliminated the gap between the alive (capable of evolution in the line of development) and the inanimate (whose irreversible changes were up to now considered only as a disintegration). On the other hand, since it was found out that in the process of self-organization the making of a new whole is conducted by establishing a consistent ordered (coherent) motion of elements of the initial medium, then it has become possible to explain theoretically the existence of macroscopic quantum effects, including those in living organisms.

In the Chapter 1 of this book you will find a detailed picture of the breakthrough in modern science which pave the way to Physics of the Alive. Here we would like to note that, with all the importance of a theoretical interpretation of the discovered empirical phenomena, such interpretation requires the very fact of a discovery. In this book the history of the discovery of the manifestation of the characteristic eigenfrequencies inherent in the human organism goes to the reader at first hand from one of the authors of this discovery, Ph.D., Prof. of Physics S.P. Sit'ko.

Considering a living organism as a hierarchy of dissipative structures which emerges and sustains itself due to the self-organizing processes gives birth to the global coherency of the organism as a quantum-mechanic system. With this theoretical approach, now we can speak about Physics of the Alive, that is the very phenomenon of life in its integrity and self-development becomes a

subject of physics. This does not mean that physics will completely exhaust the phenomenon and take the place of all other sciences concerned with the alive. However, if the living organism exists as a whole, then this integrity must have not only its manifestation but also a basis in the physical aspect of the existence of the life. As is shown by theoretical and experimental studies in the field of biophysics of complex systems and Physics of the Alive, the account of the possibility to maintain the macroscopic organism's integrity with the help of the efficient coherent mm-range electromagnetic field allows us to solve many problems which are unresolvable within the framework of short-range chemical interactions. Thus, there appears a chance to create fundamental theoretical biology as a system of sciences on the alive in all aspects of its existence.

From its very first days, Physics of the Alive was closely related to medicine. Microwave resonant therapy as the first step in the development of Quantum Medicine has served as both an empirical base of Physics of the Alive and an object of applying its achievements. Moreover, in this field the cognitive situation is quite different from conventional relations between fundamental and applied disciplines, i.e., from a certain influence of physics upon medicine via biology.

The fact that just the clinical studies formed the foundation for Physics of the Alive allows us to realize the role of pathology in the organism's perceptibility to the nonthermal action of the mm-range electromagnetic radiation and to explain the irreproducibility of some biophysical experiments in this field. Obviously, it was no mere coincidence that the quantum-mechanic interpretation of the observed results was at first advanced when mathematically processing exactly the clinical data. Quite possibly, the known hypothesis that the illness is not a mere vexatious deviation of the organism from its normal

state but rather an important condition of this state correlates to considering the alive as a dynamically stable self-organized system. Anyway, the connection between Quantum Physics of the Alive and Quantum Medicine, in their joint development, is highly fruitful.

The three Chapters written by Prof. L.N. Mkrtchian are in fact a physician's witness of such fruitfulness. Prof. Mkrtchian, Director of the Armenian Oncologic Center, a world-famed oncologist and author of 19 books in various theoretical and practical fields of medicine, has been collaborating with Prof. Sit'ko as long as ten years, conducting experimental and theoretical research in Quantum Medicine. In these Chapters Prof. Mkrtchian discusses not only his own results. He reviews the problems of modern medicine and emphasizes the appr priteness and imperative necessity of new drugless approaches to treatment and prophylaxis. The results of applications of Quantum Medicine, its achievements, problems and perspectives are points at issue of the medical Chapters of the book.

In order to facilitate the reading of this book by specialists in different fields of knowledge, we decided to supply its main body with authors' prefaces. In the first of them Prof. Sit'ko briefly considers the physical aspect which is expounded in the first Chapter in close connection with the problems of Quantum Medicine. The second preface is written by Prof. Mkrtchian and his colleagues Prof. V.D. Zhukovsky and academician A.S. Efimov who also have a huge experience in the field of Quantum Medicine.

The latest advances in sciences concerned with living nature are generally known: description of the structure and function of most biomacromolecules, determination of the pathways of biological substances synthesis decipherment of the genetic code, elucidation of the mechanisms of elementary biological processes. These are partly conditioned by employing the achievements of modern physics, in particular spectroscopy and physics of molecules and crystals. Many apt biophysical models are based upon the concepts of solid state physics. For example, in order to elucidate the mechanisms of the metabolic energy transport a notion of solitons — localized exciton-phonon excitations in molecular chains — was enlisted (Davydov). Theoretical calculations of the soliton's excitation energy in alpha-helical proteins (Scott) has proved to be in good agreement with the data on Raman spectra of living cells (Webb, Lisitsa).

At the same time, for all achievements in some separate fields, sciences concerned with the alive are being remained on a purely empirical level and do not answer the basic questions. How are thousands of intracellular biochemical reactions ordered in space and time? How do tissues and organs emerge in the process of cytokinesis of initially identical cells? What are the multiformity and differential stability of the alive determined by? What is the human organism with its ability to self-control, renewal and adaptation? Examining the functioning of the alive modern biology is forced to resort to anthropomorphism, i.e., imparts something like psychics to biological structures. Scientific literature is full of the following expressions: they "distinguish between their own and foreign genes," "regulate the cellular cycle," "trigger the replication mechanism," etc. For a long time approaches to create a fundamental living-nature science whose necessity was declared so widely were not even outlined.

Creating new knowledge of the structure and functioning of the alive was triggered off by the data on the action of the mm-range electromagnetic radiation (MMR EMR) upon biological objects. The main landmarks of this trend developing are connected with Ukraine.

In 1968 a group of scientists at the Kharkov Radio-Engineering Institute was awarded by the Lenin Prize (the highest award of the former USSR) for the development of pilot MMR EMR generators. In 1970 the first thesis on the millimeter wave bioeffects was defended (Zaliubovskaya) at the Kharkov State University. Concurrently, similar studies were conducted by Webb in Canada. Later, a series of scientific groups in Russia (Devyatkov), Germany (Gründler, Keilmann) and in some other countries started working on the subject. In 1982 scientists of the Kiev State University Andreyev, Bely and Sit'ko, starting from unusual "side effects" observed by Odessa physicians Cherkasov and Nedzvetsky, informed the scientific community of their discovery of "the manifestation of the characteristic (eigen) frequencies of the human organism." The revealed effect of the resonant MMR EMR action upon the human organism, on the one hand, has offered essentially new scope for medical diagnostics and therapy. On the other hand, it has given birth to a new scientific field, namely Physics of the Alive. At present, the Institute for Physics of the Alive is established at the Scientific Research Center "Vidhuk" in Kiev; it coordinates efforts of hundreds of scientists in this and adjacent branches.

The performed experiments convince us of a cardinal distinction of the MMR EMR bioeffects from other factors, including EMR of different frequency ranges. The distinction lies in that the observed regularities fall outside the scope of conventional knowledge of the interaction between electromagnetic radiation and condensed media. We may in the first place quote the following peculiarities:

1. An extremely low level of the MMR EMR power density which is able to provoke a diversified (biochemical, physiological, etc.) response of the organism. The up-to-date well-reproducible biological effects can be observed even at 10^{-20} W/cm^2 Hz, that is under not only the thermal noise level at physiological temperatures but also the level of thermal radiation fluctuations.

2. A sharp-resonant character of the interaction. The effect manifests itself at the frequencies strictly determined for each organism and disappears under detuning of the order of 0.1-0.01%, with the

resonance band becoming narrower while the acting radiation power decreasing. Existence of such sharp resonances in condensed media at T=300 °K is, in principle, a quantum-mechanic and thermodynamical impossibility.

3. Macroscopic distances between the area of the effective action and the diseased organ. It is established that the optimal action areas coincide with the corporal acupuncture points located largely along specific channels — "meridians." Besides, any stable morphological distinctions were found neither along the meridians nor at the very points. The mechanism of signal transmission from the point to the diseased organ (i.e., at distances of tens of centimeters) remains unclear, given that, on penetrating 1 mm of biological tissue. The MMR EMR intensity becomes weaker by a factor of 1000, being absorbed by intratissue water.

4. The MMR EMR biological action is directed to recovering the disordered functional state, with the efficiency of the corresponding reaction being lowered in the course of treatment. A recovered organism does not practically response to the same EMR. This enables us to introduce a new criterium of the "healthy" organism.

The conventional paradigm of physical nature of the alive can be revised only within the scope of the latest advances in modern physics, such as nonlinear electrodynamics, nonequilibrium thermodynamics, quantum field theory, synergetics and dissipative structure physics. First of all, it should be stressed that living systems are thermodynamically "open" (nonequilibrium) and nonlinear in their character. In such systems there may emerge qualitatively new, dynamically stable spatio-temporal structures due to nonequilibrium phase transitions (Haken). The energy spectrum of such systems is quantized; there may be brought about effective long-range forces due to spatio-temporal ordering (coherency) (Fröhlich).

Apparently, these statements should serve as basic points of theoretical (fundamental) biology. They form the foundation for the concept of "Quantum Physics of the Alive" (Fröhlich, Sit'ko).

Within the framework of this approach every macroscopic object, including the man, is an integral macroscopic quantum system. Multi-

formity, differentiation and stability of species and individuals are ensured by the quantum-mechanic principles of identity and discreteness. Nominally, only one condition — formation of a nonlocal self-consistent potential of a biological object as a whole — should be satisfied for an integral macroscopic system to be treated quantum-mechanically. Such potential can be created as a result of not usual short-range chemical (molecule-to-molecule) interactions but effective long-range (of the order of human body linear dimensions) ones. It is assumed that the latter can be arranged by the coherent, synchronic in space and phase, organism's electromagnetic field of the range of observed characteristic frequencies. In water media the mm-range coherency can actually be established owing to high probability of the induced transitions as compared with the spontaneous ones. The "inverse population" of active centers, i.e., cells, is maintained by their metabolism due to a mechanism referred to as "hierarchy of dissipative structures." The role of active centers can be played by cells whose "inverse population" admits an ability to produce electromagnetic radiation as well as by subcellular structures which are active over the millimeter range. Ultimately, the coherent field spectrum possesses the whole wealth of the hereditary information stored in DNA.

An apt interpretation of the self-consistent potential of a whole organism can be given with the help of the limit cycles — time-periodic and stable structures which emerge in a dissipative medium, i.e., in open systems with active centers-cells. Within the scope of this concept the existence of the meridians as trajectories of organism-borne traveling electromagnetic waves can be explained in a natural way. These meridians form the organism's "electromagnetic frame" which is produced by every cell, and at the same time maintains the multiformed differential stability of the organism, i.e., is a genetic information carrier.

Not dwelling upon the proposed concept, we note that there exist numerous experimental data in its favor. The basic possibility of cells and subcellular structures to participate in creating the unified electromagnetic field of the organism is corroborated by the discovery of

mm-range activity (according to resonances in the spectra of action) of some "pre-living" forms: water (Andreyev), amino-acids (Litvinov), DNA (Belyaev); over the same range resonance absorption bands of cells (Webb) and cellular membranes (Blinowska) as well as some data on the cellular intrinsic narrow-band microwave radiation (Bannikov) were recorded. It was also reported on the direct experimental evidence of macroscopic quantum effects in living systems: during cytokinesis the cells manifest the properties of a Josephson's junction, i.e., of a system of two superconductors separated by a dielectric layer (Smith). A Josephson-like behavior of bioobjects was also observed by other researchers (Samedov, Yakunov).

The ideas developed by Physics of the Alive spread far beyond the limits of electromagnetic biology and physiology. New approaches are effectively employed in studying the influence of ultralow dose radiation upon the organism (Belyaev). A notion of "dynamical stability" can be useful in rationalizing many problems in the conventionally quantum-mechanic realm — physics of the nucleus and elementary particles.

As regards applied aspects of this concept, we first of all accentuate the perspectives of diagnostics and treatment of the man by using basically new methods and, next, the necessity of revising accepted safety standards of the environmental electromagnetic background, especially in view of rapid development of new communication facilities (e.g., satellite television) with their probable very negative influence upon the human organism.

Physics of the Alive (in whose creation Ukraine has priority) has already won the recognition of the world scientific community: annual conferences and symposia devoted to this field are being organized; a specialized international journal is founded. Thousands of physicians throughout the world, equipping themselves with not only new methods and devices but new knowledge of the very notion of "health," score big successes in treating tens of thousands of patients, formerly considered incurable from the standpoint of drug therapy. The advance in new "Quantum Medicine," in its turn, strengthens the belief in the correctness of fundamentals of Physics of the Alive.

Medical Preface

During more than 10 years in Ukraine and beyond its boarders a new method of treatment — Microwave Resonance Therapy (MRT) based on the correction of organism state by electromagnetic mm-range radiation of ultralow intensity (EMR ENF) is developing and introducing in clinical practice.

MRT is the practical realization of Quantum Medicine and Physics of the Alive ideas — new directions of fundamental science that have appeared recently thanks to realization by world scientific community the ways of self-organization and dynamic stability of nature on all levels of its existence.

Previous fundamental researches have shown the MRT influence on different levels of regulation and self-organization of living systems on system-organic, tissue, cellular, and molecular levels. The normalizing effect of MRT is realizing through neuro-humoral regulation of hormone activity, metabolic and fermentative processes, cell membrane function and ion canals, gene expression and morphogenesis.

Experimental data have become the background for MRT introduction in medical practice. As a result more than 250 thousand patients of different pathologies (near 40 nozological forms) have got the opportunity to get the treatment. In some cases either efficacy of treatment or sanogenesis mechanism have been investigated in detail. These cases are infantile cerebral palsy, aceptic necrosis of femoral head, diabetes mellitus and its chronic complications, peptic and gastric ulcers, narcotism, and alcoholism. Thus, the efficacy of treatment after first MRT course was 80 to 95%. The medical action of MRT is realized by the normalization of complex line of biochemical and immunological reactions, hormone-metabolic disorders, cell membranes functions and molecular processes.

As a result of MRT a homeostasis is restored that in terms of Quantum Medicine means the reconstruction of organism's "electromagnetic frame."

Scientific Research Center "Vidhuk" attached to the Cabinet of Ministers of Ukraine has organized the wide introduction of MRT technology: for three years and a half 1200 physicians have trained in field of MRT, 518 MRT rooms are formed, new equipment was developed and introduced to MRT technology embody, such as "Porog", "Aria", "AMRT" type, which haven't analogs in the world.

The MRT technology and equipment are defended already by two patents in USA and two in China.

MRT have the following principle advantages in comparison with other medical methods:

The first (the major).

The real possibility exists to embody the principle "to treat not the illness but the ill," which had been proclaimed long ago by eminent clinicians, by means of selecting the individual therapeutic (characteristic) frequencies of mm-range electromagnetic waves.

The individual approach to a patient being meant by the above, before the Quantum Medicine era even the most thinking and skillful physician could embody realize the major commandment of "the Greats" only as security guarantee and in the form of dosing drugs or some other therapeutic remedies. The stereotype of individual approach, such as considering the patient's weight, sex, age, even individual features, etc., can't be claimed to be a true selective correction of the patient's disordered functions, however new medicaments, properly selected doses and their administration methods may be.

While acting with electromagnetic waves of mm-range frequency the physician is making use of the opportunity given by Quantum Medicine and being radically new — to correct disordered functions of the patient's organism with the remedy, which is as individual as blood group (taking into consideration the up-to-date extended analysis data), dactylogram, genetic code, i.e., any true uniqueness of the Alive diversity.

Thus, the approach novelty is laid down in the very essence of MRT, the efficacy of which, in distinction from conventional treatment methods, is not simply dependent on the individual approach to the patient, but defines this approach thoroughly.

The second.

The combination of general correcting effect on the patient's organism with the efficient influence on the focus of disease (an ulcerous defect, chronic inflammatory or algesic syndromes, etc.) allows to appreciate the principle "to treat not the illness but the patient" in a new fashion and to pass on to the new possibilities of treating "both the illness and the patient" with so long remission periods provided under the therapy of some incurable diseases that the patient's condition being near to rehabilitation may be stated.

The third.

There are no negative side reactions, this fact having been confirmed with the extended experimental and clinical investigations, so the widespread use of MRT may be recommended for treatment and prophylaxy of different diseases.

The syndromic intellectual system of clinical thinking allows to get the particularly clear estimation of MRT advantages. This system, in distinction from the nosologic system, enables to approach to the estimation of treatment results in a more differentiated way. The quantity and the diversity of diseases (nosologic forms), for which MRT was found to be efficient, may give a pretext for a banal discredit of the method as being "quasi-panacea." The syndromic principle of analysis shows that high percentage of positive results for certain states includes rehabilitation of all lost functions, and for other states — the elimination of some specific syndromes or symptoms, e.g., pains in oncological cases.

The fourth.

MRT corrective effect may be realized in different ways, the release of endogenous biologically active substances being one of these ways. The corrective effect of endogenous substances surpasses significantly the effect of preparations administered into the organism externally. That is why the conclusion (evidenced by clinical practice) is clear about MRT treatment being for a number of diseases more efficient than drug therapy.

With time, in all probability, our ideas concerning medicinal pragmatism and other active, sometimes unnatural, curative measures

will be reconsidered. The qualitative jump in ensuring health for wide layers of population may be closely connected with the fundamental conception of the modern natural science — "Physics of the Alive" as the scientific basis for the improvement of naturopathic methods not only of treatment but also of prophylaxy. The examples of malignant tumors, thromboembolic pathology, chronic non-specific pulmonary diseases and other diseases show demonstratively the weakening, especially in the last decades, of the non-specific resistancy of the organism. In future we also will not be able to prevent people from being ill with atherosclerosis, malignant tumors and many other kinds of non-infectious pathology, but we, apparently, will be able to compensate the weakened organism stability to the unfavorable environmental factors by nondrug physiological means. The data obtained about the prevention of some specific pathologic processes inspires with optimism. We want to express the conviction that in the nearest future just the prophylaxy will occur to be the most successful in the struggle against widespread human diseases. On this purpose it is necessary to have scientifically founded step-by-step re-orientation of the health service, the doctrine of which will be not patient's return to previous state but stabilization of health. We are deeply convinced that the dynamic infrastructure of qualitatively new health services in XXI century together with other trends must include the diseases prophylaxy based on the fundamental doctrine of Physics of the Alive — the timely correction of the metabolic-throphic processes by means of stabilization of human coherent electromagnetic field.

Chapter 1

Conceptual Fundamentals of Quantum Medicine

> "We must be prepared to find a new type of physical law prevailing in living matter. Or are we to term it a non-physical, not to say a super-physical, law?
>
> No, I do not think that, for the new principle involved is a genuinely physical one: it is, in my opinion, nothing else than the principle of quantum over again."
>
> Erwin Schrödinger
>
> "What is the life?", 1943

Quantum Medicine is a new term put into general use after the scientific community recognized a radically new approach to the problem of formation and varied differential stability of living systems, the approach based on the latest achievements of fundamental natural sciences supported by many-sided experimental and clinical research, and named "Physics of the Alive."

Today, 50 years after the lines making the epigraph of this Chapter were written, we can only be astonished by the brilliant foresight of the author of quantum mechanics which, as is generally known, determined a fundamental character of the sciences that study objects at three levels of the quantum organization of nature: nuclear, atomic and molecular. The comprehension of the idea that the Alive takes up the next, the fourth stage of this, according to Weisskopf,

"quantum ladder of nature," unites "life"-"non-life" in the methodological aspect and creates the necessary prerequisites for erecting a long-awaited building of the fundamental biology and medicine [1].

❖❖❖

At present there exists the multitude of sciences which treat animate nature as the subject of their study. However, despite the impressive achievements in molecular biology, genetics, genetic engineering, transplantation medicine, microsurgery, etc. — present sciences on the alive are not in a position even to approach the answer to such seemingly elementary questions which can be put by a child under school age: "Why does an inadvertently cut finger on a hand heal?". And we shall add: "Moreover it heals so that in many cases there is no trace at all." And when one puts a question as to why one individual differs in appearance from another and this difference is preserved over a long period of time, most often one can hear a reference to genetic information which is rather popular now. But specialists know well that at the level of DNA we are able to trace only the production of amino acids and the synthesis of proteins out of them. And not more than that. But where is the expected association with the shape of nose, the color of eyes, with the difference in the morphology of a man and, for example, that of a rat?

As a matter of fact, the simplicity of the questions stated is delusive. They can be answered only in the context of understanding the phenomenon of the differentiation of tissues, and the morphogenesis formation, i.e., those key processes, with the untangling of the mechanisms of which the overwhelming majority of scientists of the world associates the advent of theoretical biology and medicine.

At this point it is appropriate to recall that the modern Western civilization has been adhering to the atomist doctrine of the cognition of the world for quite many centuries. Originally, these were purely speculative considerations of great thinkers of ancient Greece (Democritus and his school, 5th C.B.C.) on the existence of an indivisible fundamental of everything being, i.e., atom. Later the truth of the atomist concept was demonstrated by the entire development of

science and technology. It would seem that the whole experience of mankind ("Western" one) indicates that by studying the constituents of the compound matter we cognize this compound matter more and more deeper. In other words, over a period of the last centuries it has been generally recognized that the fundamental knowledge of the world can be acquired only on the way to the examination of the object microscopic structure.

New natural sciences also contributed to the strengthening of this opinion. Indeed, the achievements of spectrum analysis in the field of nuclear, atomic and molecular physics have shown that the knowledge of eigenfrequencies introduced by quantum mechanics (through its fundamental principles of identity and discreteness) makes it possible to obtain universal "certificates" for each type of nuclei, atoms and molecules. In fact, one gives an unambiguous quantitative definition of all integral microscopic objects, comprising forming the world around us, in the language of energy spectra. This means, for example, that all nuclei of iron in the Universe have the 1st level of excitation amounting to 845 KeV and absolutely the same spectrum of eigenfrequencies which is a fundamental characteristic of the nucleus of this element. A similar situation exists both at the atomic and molecular levels — a spectroscope operator determines chemical composition of a specimen by burning a piece of the material being examined, and as this takes place, analyzing the flame spectrum he uses reference "certificates" of the expected elements in the form of the spectra of their eigenfrequencies and determines the specimen chemical composition.

Since supramolecular structures in the condensed substance because of the effect of "strong bond" can not form the discrete spectrum of eigenfrequencies with narrow, one particle type levels — the molecular step of the Weisskopf quantum ladder is considered to be the last whereon the events of a fundamental character take place.

On the other hand, out of 4 forces of nature known to science — strong, weak, electromagnetic and gravitation one — only the last two are of a long range action character. However, the gravitation interactions are relatively very weak, and the electromagnetic ones in the

condensed substance also become effectively short range active due to screening. Thus, the treatment of the problem of the fundamentallity also from this point of view leads to the similar conclusion: everything qualitatively important is resolved at a microscopic level at the distances comparable with the dimensions of molecules. And namely by virtue of these reasons (irrespective of the fact whether we realize it or not) such sciences as molecular biology, genetics, cytology, biochemistry are considered "fundamental" in biology and medicine.

However, if in the field of inanimate nature this dismemberment of the whole in the spirit of atomism has yielded, as it was mentioned above, its outstanding results in the form of the discovery of three fundamental levels of the nature quantum ladder ("the crisis of elementariness" originates only at a subnuclear level), in the field of animate nature — the study of the systems at the level of cellular, subcellular and supracellular structures leads to a peculiar anthropomorphism. As it takes place, all examined structures of the Alive, in fact, are endowed with conscience and mind: DNA, lysosomes, cellular membranes, cytoskeleton, immune system, etc. The following terms are applied to them: "they are taught to differentiate their antigens from strange ones," "they control the sequence of events," "they adjust a cell cycle", "the mechanism of replication is actuated," "the necessary amino acids and proteins are being produced", "the formation of internals is in progress", "the membrane channel opens and closes," etc. And though in this case each time it is possible to find a biochemical reagent which has caused a particular process (of the morphogen type), the picture of the activity of the Alive at a cell (and adjacent) level, described by means of microscopic examination, produces, as a whole, an impression of a fantastic novel when each cell (or their collection) must possess the structures characteristic of a developed State with its schools, universities, hospitals, army, informers, plants with their technical councils, etc. It is in this concept that we see the crisis of "atomism" as applied to living matter.

The way out of this situation was not seen and therefore even outstanding biologists of the present viewed skeptically the a possibility even to approach the understanding of the nature of the Alive.

At the same time when attacking the problem under investigation one could not but notice that the subject of inquiry — the Alive — have the features which distinguish it radically from standard objects of physics. First of all, this is the availability of the very fact of the development of the Alive: from a grain (seed) and zygote to a grown-up plant and an organism. Moreover, both in the development of individual specimens (ontogenesis) and in the development of everything alive or separate taxonomic groups (philogenesis) one observes the complication of the structures characterized by the decrease in the group of symmetry. From intuitive considerations it is obvious that such a picture is in a complete contrast to the one which is encountered in ordinary situations in unanimated nature when the ordered structures, if left to their own devices, change into the disordered ones. In physics (and more specifically, in thermodynamics), such an asymmetry in time is expressed by the second law of thermodynamics which requires that a certain measure of such a disorder — S entropy — in the closed system, to increase until it peaks. The law of the increase of entropy $dS \geq 0$ is fulfilled in all inanimate closed systems whose behavior is described by the linear laws.

Originally, the notion of entropy was introduced for the characteristic of the behavior of one type objects (molecules of gas, liquid, etc.) which are in the thermal equilibrium, characterized by temperature T:

$$dS = \frac{dQ_{rev}}{T}, \tag{1}$$

where T is the absolute temperature, and dQ_{rev} is the quantity of the heat reversibly supplied to the system or withdrawn from it.

It is apparent that the application of such an approach to complicated systems even mechanical ones, to say nothing of living systems, meet with some difficulties. Therefore the notion "information entropy" [2] has been introduced into general use. It is defined as

$$S_{inf} = -\int_0^\infty f(U) \ln f(U) dU \tag{2}$$

— where $f(U)$ is the distribution function depending on the potential energy of system U.

Regarding the transition from the Non-alive to the Alive as a non-equilibrium phase transition, synergetics determines the equation for the order parameter ξ as:

$$\dot{\xi} = \lambda\xi - \beta\xi^3 + F(t) \tag{3}$$

with parameters λ and β and fluctuating force $F(t)$. It can be shown that in a stationary state Fokker-Planck equation will give the following probability distribution for the potential of parabolic type $U=r^2$:

$$f(U)dU = N\exp\left\{\left(\lambda U - \frac{1}{2}\beta U^2\right)Q^{-1}\right\}dU \tag{4}$$

(here Q is the noise level). In this case constant N is determined from the conditions of normalizing $\int_0^\infty f(U)dU = 1$. Parameter λ is called a control one. It conditions the transition of the system from the state "no life" ($\lambda<0$) to the state "life" ($\lambda>0$). In this case if we make use of Klimontovich S-theorem according to which the dynamics of the information entropy of the system in the phase transition should be examined with the average energy being constant.

$$\langle U\rangle = \int_0^\infty Uf(U)dU \tag{5}$$

i.e., by normalizing the entropy prior to and after the transition by the magnitude of noise Q, we obtain:

For the energy prior to the phase transition

$$S_{before} = \ln\frac{\lambda}{\beta} + 1 \tag{6}$$

After the transition on the reasonable assumption $\frac{Q\beta}{\lambda^2} << 1$, when the distribution function is properly approximated by the expression

$$f_{after}(U) = N\exp\left[-\frac{\beta}{2Q}\left(U-\frac{\lambda}{\beta}\right)^2\right] \tag{7}$$

the normalization factor is found to be equal

$$N = \sqrt{\frac{2\beta}{\pi Q}}, \text{ and } S_{after} = \frac{1}{2}\ln\frac{\pi Q}{2\beta} + \frac{1}{2} \tag{8}$$

i.e.,

$$S_{after\ max} = \frac{1}{2}\ln\frac{\pi}{2} + \ln\frac{\lambda}{\beta} + \frac{1}{2} \tag{9}$$

and since $\ln\frac{\pi}{2} < 1$, it means that

$$S_{before} > S_{after} \tag{10}$$

i.e., the entropy of the system after the non-equilibrium phase transition that results in the formation of certain structures of the most general nature turns out to be less than prior to such a transition. Our intuition has not betrayed us: living systems can not be regarded in the context of the equilibrium thermodynamics, the information entropy reduces in the process of the phase transition "life"–"non-life" and, consequently, the application of the same "atomist" approaches, which are used efficiently in solid-state physics, with respect to living systems can not be considered justified. Therefore it comes as no surprise this practically deadlock situation which is encounted by natural scientists who try to understand the nature of the Alive in the context of "solid-state physics."

What is the way out of the situation that has arisen?

Two circumstances have played a decisive role in the fact that at present one observes the breakthrough in understanding the nature of the Alive. The first one — these are radical changes which have taken place within recent years in the in-depth fundamentals of such seemingly "classical" settled sciences as physics and chemistry. We mean here the realization by the scientific community of the role of "openness" of the systems under study and nonlinearity in its dynamic

functioning. This realization has been formed for more than a century and half: starting from the first descriptions of solitary waves in testing new outlines of ships for navigation in channels of England made by John Scott Rassel up to the creation of new interbranch science "Synergetics" by Haken, and awarding the Novel prize to Prigogine in 1977 for revealing the role of "dissipative" structures in the transition from the physics of "existing" to the physics of "becoming." Unfortunately, here there is no possibility to dwell on the collisions of the penetration of the nonlinear thinking in the mind of natural scientists. These are amazing years in the history of science which have marked the understanding of the fact that the subject of study for the up-to-date physics is not only the world formed billions years ago fractions of a second after the Great Explosion, but also a huge variety of surrounding objects and systems (of artificial and natural origins) for which the laws of equilibrium thermodynamics are not sufficient. It has turned out that in open, nonlinear systems, far from the heat equilibrium, as a result of the non-equilibrium phase transition quantitatively new, dynamically stable, spatial-temporal structures may originate. Namely these structures were under consideration when deriving the relationship $S_{before} > S_{after}$ which shows the possibility of reversibility of "time arrow" in the dissipative systems owing to the so-called negative growth in the entropy from outside $dS_{out} < 0$ which compensates for a usually positive production of entropy in the closed system $dS_{intern} \geq 0$

$$\Delta S = S_{after} - S_{before} < 0 \qquad (11)$$

$$dS = dS_{out} + dS_{intern} \approx 0. \qquad (12)$$

In other words, in the systems far from heat equilibrium, due to their openness and nonlinear dynamics it is possible to create qualitatively new subjects of the physics of prolonged existing, dynamically stable complex structures.

Concurrently, has been coming the understanding of the fact that the quantum-mechanic approaches are not obligatorily applied solely to microscopic objects whose scales are determined by Planck's constant. The amplitude and phase of the wave function, the spectra of

eigenvalues and other characteristics of the quantum-mechanic systems have come into general use when describing such "macroscopic" phenomena as superconductivity, superfluidity, Josephson's effect.

In the context of the modern concepts of self-organization I. Prigogine has approached the problem of time in a new way, trying to solve a known contradiction between the reversibility of time in two-particle interactions and its non-reversibility in many-particle interactions ("time arrows" in the second law of thermodynamics). It can be clearly represented in such a way. A film about colliding two balls and another film about getting of an ink drop into a glass with water are shot. In the first case the film demonstrated in the mode of reversible time, i.e., from end to beginning, will not cause any surprise, while "the spread" of the ink drop in water in direct demonstration is a natural physical process (the entropy increases), whereas the reverse film wherein the drop forms originating from the volume of water is not real, like, by the way, any fiction film demonstrated in a reverse direction is not real.

Introducing the notion of internal and external time I. Prigogine [3] has approached a conclusion, important for us, on the connection of time with the character of the system energy spectrum and the periodicity of the wave function.

An extremely profound vision of the role of the spatial and phase coherence of the system for creating efficient long arranged forces was shown by H. Fröhlich [4], the author of the theory of superconductivity.

Thus, by the beginning of the 80'ies fundamental natural sciences already had hoed the soil for principal experiments called for sprouting into a new vision of the nature of the Alive.

Therefore, the second decisive impulse in providing, if one can express oneself so, a phase transition from the traditional biophysics to Physics of the Alive in our mind was the experimental discovery of the manifestations of eigenfrequencies of a human organism in 1982. Naturally, these results were achieved not on the empty spot.

In 1969-1972 the first results of the experimental research were published. They started a series of works carried out in different labo-

ratories of the world until the present time under the general name "Effects of resonance interactions of low intensity mm-range electromagnetic radiation with biological objects."

The generally recognized achievements of scientists of the city of Kharkov (Ukraine) in the development of the first specimens of mm-range equipment contributed to the fact that namely in this city biophysicist N.P. Zaliubovskaya using the experimental base of the local state university carried out pioneer research on the above theme at such a high level that in 1970 she could defend the doctor degree thesis [5]. "Pronounced biological activity" of the mm-range waves on biological objects of different nature was shown: microorganisms, isolated cells, fruit fly, experimental animals — white rats and white mice. The analysis was made on the basis of the well-known microbiological, virological, biochemical, biophysical and other methods of research. The radiation power density was equal to 1 mW/cm^2. The wave length band spread from 1.7 to 8.0 mm. The action effect was of a resonant character (in the range of 6.5-7.1 mm) and showed itself as the change in the intensity and in the character of the course of life processes. According to the author's definition the resonant character of the effect "consisted in the fact that the irradiation with a certain wave length yields a different result than the irradiation with another wave length even sufficiently close to it."

We dwell on the thesis of N.P. Zaliubovskaya so comprehensively not so much because it was the first work on the range of subjects being considered as also because dozens of articles and books published in open press after this and up to 1984, as a matter of fact, did not contain anything radically new. Only the works of S. Webb are an exception, for he was the only one who managed not only to succeed in extremely complex experiments on direct measurement of the specific features of the spectrum of absorption of the mm radiation [6] by biological structures, but he also managed to make a comparative analysis of such spectra taken on the specimens of healthy and malignant cancer tissues [7].

What seemed amazing and unknown in all these experiments from the standpoint of the science of that period? Needless to say that

it was the resonance dependence of bioeffects, and the presence of the resonances with the same width in the absorption spectra. It was mentioned above that the spectra of characteristic eigenfrequencies, in other words the line nature of spectrum, is inherent in nuclear, atomic, and molecular level of organization of matter. Heavier structures (among these are "heavy" protein molecules) taken alone. or, e.g., in gaseous state, could oscillate at lower frequencies than those usually associated with molecular spectra. As is known, classical expression $\omega_{osc} = \sqrt{k/m}$ will give the correct order of magnitude in the process of integration of classical and quantum representations. Hence, at real values of elasticity coefficient k for m (mass) being above 100,000, $f_{osc} = \frac{\omega_{osc}}{2\pi}$ is found in 10^{10}-10^{11} Hz range, i.e., it corresponds to millimeter range of electromagnetic spectrum. However, at the expense of strong coupling in condensed matter bandwidths become wider than their spacing, and therefore, characteristic spectra in mm-range of waves with narrow single-particle lines are assumed to be impossible. That is the reason why the experiments in which the resonances with Q-factor equal to 100 and more ($Q = \frac{\omega_{res}}{\Delta_{1/2}\omega_{res}}$) show a certain feature typical for the living system only.

Therefore it comes as no surprise that in the wake of N.P. Zaliubovskaya and S. Webb a great number of research centers in different countries joined to the studies of resonance response of living objects to mm-range electromagnetic radiation. In the former USSR academician N.D. Devyatkov [8] took charge of these investigations, in FRG — Max Planck Institute in Stuttgart, in Italy — the scientists in Milan University. Great contribution in the understanding of the data obtained has been made by H. Fröhlich (see [4]) who extended his ideas of coherence, used as the basis for superconductivity theory, to cover the biological systems.

However, great expectations associated with these studies soon gave way to disappointment: the researchers failed to obtain reproducible results even under identical experimental conditions; i.e., from the point of view of the necessary condition which provided the serious attitude to the data obtained was violated. With the account of qualification and top professional level of researchers it was evident that the producibility of results could be associated only with fundamental difference between the objects under study in the characteristics of the living systems beyond the area of scientific exploration performed at that period [9].

In 1979-80 the important result was obtained by physicians Cherkasov and Nedzvetsky [10] who were applying spin-effect for eye diseases and thus discovered the "adverse" healing effect of mm-range electromagnetic radiation (EMR) with 5-6 mm wave-length manifested at certain frequency ranges. Gastric ulcer, e.g., was thus healed due to EMR action on the eye or occipital area. It were the results, unbelievable from the point of view of traditional ideas of medicine, that inspired three Kiev University physicists Ye.A. Andreyev, M.U. Bely and S.P. Sit'ko to initiate fundamental studies of the nature of the alive. In 1982 they reported their discovery of the "manifestation of the characteristic eigenfrequencies of human body" to scientific community [11]. At that time the terms of quantum physics used for the investigation of the alive would sooner exposed the authors' emotional attitude to the experimental data than a profound understanding of the place of the phenomenon under study in the system of knowledge about nature. This insight was developed much later.

At that time, in 1982, it was established that in case of functional disturbances (disease) human organism acquired extremely high sensitivity to mm-range electromagnetic fields (EMF) resonance dependence on frequency and localization on the body surface. The sensitivity is manifested in the fact that EMR action on human body performed at resonance frequencies through certain sites on the body named biologically active points (BAPs) results in secured rehabilitation of body's functional state, i.e., in healing. In this case patient's

response to EMR is decreasing, and complete recovery is characterized by the loss of sensitivity of the body to the mentioned EMR fields.

What is unusual in the above phenomenon? Why did it fail to find the explanation within the frames of the ideas that prevailed in physics, biology, and medicine at that period? And finally, what way out was suggested?

There are several problems which cannot find their explanation within the frames of traditional approach.

The first. Extremely low level of power, which performs the effective action on the body.

In the early experiments on protozoa the EMR sources with output power up to 10^{-2} W/cm^2 were used, which is on the borderline of measured thermal effects and for a couple of years served as a source of numerous arguments on "thermal-nonthermal" nature of the effect. At present, the level of effective power was reduced by many orders both in resonances defection in biological experiments and in clinical routine.

Now the threshold power level amounts to 10^{-12}–10^{-18} W/cm^2 which is not only billion times less than the level of thermal radiation of skin surface unit, but also incomparably less than the fluctuation level of this radiation.

The second. Macroscopic distances between the exposed area and the subject of treatment (tender organ).

Indeed, the studies showed that in the analyzed experiments BAPs coincide with the localization of the exposed points traditionally used by acupuncture [12]. As is known from the existing ideas on acupuncture, the majority of corporal acupuncture points are located along the fixed trajectories on human cutaneous tissue. In the opinion of ancient Chinese thinkers these trajectories described "meridians" in Russian literature, and "channels" in English are the ways for propagation of the life energy which is connected with the Universe and is an integral part of ancient Oriental philosophy. Within the frames of these concepts in addition to the external ways of meridians there exist internal ones which pass through the most important organs of the

body. Twelve couples of meridians respectively derive their names from lungs, heart, liver, kidneys, etc.

Apart from them two single meridians are specified: Front-Middle and Back-Middle. The so-called Miraculous meridians basically formed from the fragments of 14 conventional meridians also belong to the meridian net. With respect to ancient Chinese medicine, the activity of Miraculous meridians is initiated as a result of functional disturbances in the body, and their topology is determined by particular types of diseases. To cure a disease a special set of acupuncture points which are located on the meridians passing through tender organs is suggested by needletherapy. Therefore, the answer to the question about the bond between the site exposed to mm-range EMR and the tender organs seems to be evident: "the communication is performed through the meridian net." The problem however is that, apart from ancient Oriental knowledge, we have no other information on the nature of Chinese meridians expressed in terms of western "scientific" medicine. Although at intervals certain histological deviations are reported in cutaneous and subcutaneous tissues (the increase of fat cell concentration, etc.) in the vicinity of acupuncture points, they are nullified by the other reports, and thus, a conclusion can be made that the morphological peculiarities are nonexistent either along meridian trajectories or in acupuncture points.

Hence the problem of signal transmission from BAP to tender organ has yet remained unsolved. It should be taken into account that, as a rule, the best pronounced healing effect is manifested under EMR action on distal BAPs, i.e., on initial or final points of the meridian which are located on digits and toes. Thus, in many cases we speak about the distances measured in tens and hundreds centimeters, and the intensity of mm-range radiation in 1 mm^3 of water solution is known to decrease almost a thousand times.

Comment on terminology. In the countries of the former Soviet Union the term "needlereflex-therapy" is used more often than "acupuncture." From our viewpoint it is a pseudo-scientific term — the tribute to primitive materialistic ideology which was to be paid by

the medical science of the USSR to be allowed to use this nonscientific "idealistic" method of treatment.

The third. Resonance (in frequency) nature of effect. This problem was mentioned above in relation to the experiments on more simple biological objects. The following conclusion has been made: from the standpoint of solid-state physics, in condensed matter the transitions in mm-range of spectrum which correspond to single-particle discrete states, i.e., with Q-factor exceeding 100, cannot be observed.

The fourth. Unique is a phenomenon of one-way of EMR action from "disease" — to "health" condition and the absence of response in healthy subjects. Thus we suggest a definition of healthy organism. It is the organism which does not respond to external mm-range EMR under the given functional regime.

Now the poor reproducibility of results in the experiments on the subjects with a more simple organization than in human body becomes clear [8]. To obtain a resonance response to low-intensity mm-range EMR it is necessary but not sufficient to deal with the living subjects. Besides, of importance is the choice of exposition site and the presence of functional disturbances. "Healing effect" persistently changes the subject in the process. Therefore it is conceptually incorrect to discuss the reproducibility using one living "specimen" as an example. The only exception may be represented by the experiments on certain protozoa — "incurable cases" (if medical terms are used) such as colon bacillus *E.coli* with the inoculated λ-prophages.

Even here unexpected things are not improbable. As was shown by Shapiro [13], the present classification of unicellular organisms as independent living systems is inadequate. Indeed, almost all types of unicellular organisms in the free state from the macroscopic colonies with features and habits of an integral living system: the search for food, bypass of obstacles, rehabilitation of the disturbed form, etc. Even the genes responsible for the behavior and properties of such a loose "individuals" were discovered in the process.

Two conclusions can be drawn from the above:

1. To interpret all the previously obtained data the experiments on rehabilitation of human body's functional condition with mm-range EMR appeared to be of fundamental importance. Direct contact between the doctor-operator and the subject, possibility to control the changes in patient's condition with diagnostic devices — all this helped to discover new aspects of the problem.

2. The problem of data reproducibility should be regarded from different points of view: the statistics obtained at modeling of action function for one subject should be changed for the statistics of the action functions for many similar subjects. As applied to humans, it means that the results of treatment with mm-range EMR should form the experimental basis for the concepts of the nature of the alive.

The selection of the exposition points, the choice of therapeutic ("resonance") frequency (or frequencies), exposition time for every point and for all session of treatment, mode of action, beam parameters and beam area on the body surface, polarization and its vector orientation with respect to meridian trajectory, power, spectral composition, selection of recycling regime, compatibility with drug therapy, patient's regime before and after the session of treatment, necessary level of comfort and conditions of treatment, type of EMR source and possibility of combination of different sources — all this represents the technique of a new method of treatment called Microwave Resonance Therapy (MRT).

By November 1, 1992 193,000 patients have been successfully healed in hundreds of clinics, hospitals and medical research institutes on the territory of the former USSR and beyond its boarders.

Special features of MRT were manifested by the fact that routine medical examinations, namely the selection of homogenous groups of subjects for placebo trial, double blind test, performance evaluation of different MRT methods in comparison with drug therapy, acupuncture, laseracupuncture, electroacupuncture, magnetotherapy; and biochemical, immunological, biophysical, histological, virological, microbiological, genetic tests in addition to clinical ones appeared to be insufficient. All methods of diagnosis were to be involved: known before and specially developed for that purpose, which allow a control

over patient's condition in real time regime, i.e., the continuous monitoring of measurable parameter changes during frequency tuning and for therapeutic frequency adjustment. The sensation of comfort should not be upset in the patient by control procedure because his reports help the doctor "to find a resonance." Radical changes in patient's condition are observed immediately in the course of MRT session. Owing to this, the onset of healing process, as a rule, is easy to record. Human body responds almost immediately to the impact performed at therapeutic frequency by the alteration of electric cranial and cardiac activities, by acidity and chemical processes in blood, urine, and saliva, by changes in muscular activity, blood pressure, capillary system, inflation, dynamics and rhythm of inner organ activity.

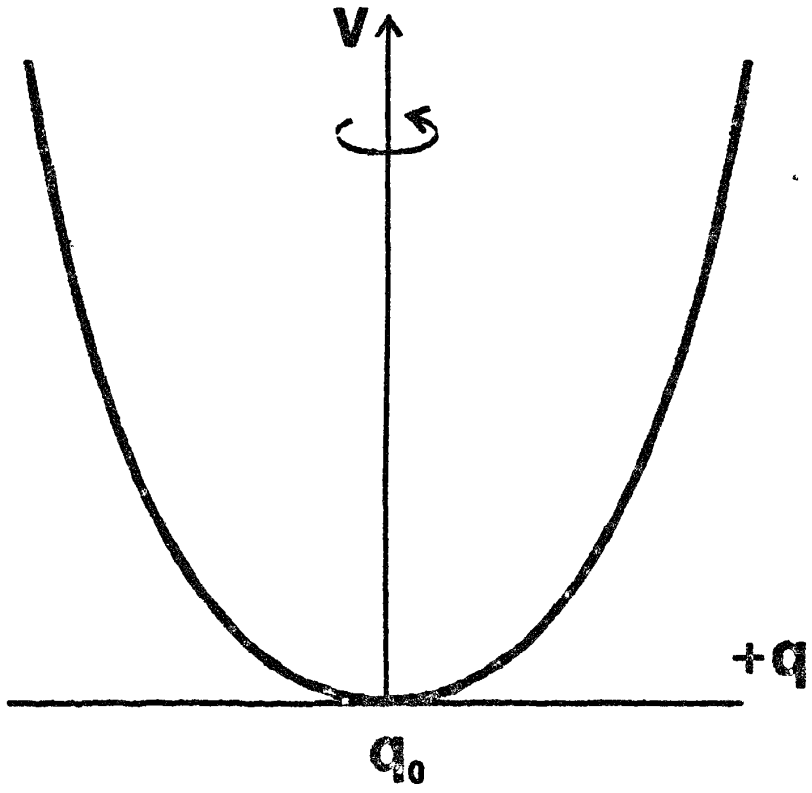

Fig. 1 Visualization of the stable solution of the equation $\dot{q} = -kq(q_0 = 0)$ by introducing the potential energy $V(q) = kq^2/2$ interpreted as slope of a hill down which the mechanical object moves

Termination of MRT effect however is more problematic to record owing to the above "memory" effect by which the process of treatment is determined. Nevertheless, in a number of cases "resonance" in the action function has a classical, symmetrical Lorentz form (Fig. 4), though for good reason trigger form of resonance with a large constant of exponential decay is preferable from the point of view of recovery period reduction. Therefore the search for pronounced apparatus resonances of Lorentzian type in action function and for the objects in which these resonances are reproduced is

mainly vital for the study of functioning and stability mechanisms of the living systems.

Health service institutions cannot always provide, e.g., instantaneous Fourier-image of patient's encephalogram synchronized with the frequency of GHz-range sweep generator to obtain the picture similar to the one in Fig. 4. However, the availability of such devices will not provide the unambiguous recommendation for the choice of treatment regime. For example, human brain can generate α-rhythm signals prior to treatment thus making it necessary to took for another method of resonance search. Apart from this, there can be several resonances and not all of them provide optimum treatment regime. Therefore, the search for therapeutic frequencies with the use of a device should be complemented by the other criteria of treatment efficacy.

In the first place, this is the clinical picture analyzed by the doctor in collaboration with the patient. In fact, this approach has been recommended by text-books of medicine published in all countries of the world though it has remained unrealized in all the countries (including highly developed ones) in the epoch of high medical technologies. The case in point is that the physician should "face the patient."

Undoubtedly, nostalgic emotions over family doctor attitude to his patients may result from discontent of many patients with the possibilities of well-equipped modern medicine. It has already been mentioned in Chapter 1 that success rate in many diseases which affect humankind is much more humble than the amount of means and efforts spent for medical technical equipment. In our view, it shows the empiric nature of traditional medicine which is continuously utilizing the "trial and error method" inevitable at the first stage of development of any science though undesirable at the second. Physician's revert to the patient which takes place (or, more precisely, will take place) at the stage of creation of the basis of fundamental medicine is of different nature: patient's complaints, patient's reports of his condition and its dynamics in correlation with treatment and with round-the-clock rhythm, patient's comments, which may seem to have no

relation to his disease, the condition of his nails, points (and sites) on the body tender to touch — all this represents an important stage at MRT diagnosis and treatment.

Since the advent of Microwave Resonance Therapy, a prototype of Quantum Medicine, the notion of "diagnosis" began to change its meaning in the system of health rehabilitation. Now, when the number of the so-called incurable diseases is growing, the axiom, as it seemed, that "diagnosis should be made prior to treatment" is reduced to the thesis "treatment (to say nothing of healing) is out of the question, and God Almighty help us to make a correct diagnosis." In this situation the diagnostics acquires a self-sufficient value, as if the major task of a physician (by a witty though a grave remark of a well-known Moscow professor, Dr. V.D. Zhukovsky (1989)) consists in "confirmation of diagnosis during the autopsy. The patient treated by an experienced physician must die of a disease he was treated for."

Fetishism of "exact diagnosis" sends millions of patients, their relatives and friends from clinic to clinic, from one consulting physician to another, from country to country with the hope that pinpointing of one of 10,000 cells according to Geneva classification will solve their problems.

Regrettably, even with exact diagnosis and with respect to the above mentioned classification the physician will treat different patients with the limited number of the same patented (or up-to-date) remedies.

General enthusiasm about "early diagnosis and prevention" which resulted in the creation of gigantic diagnostic centers with excellent and very expensive equipment did not alter morbidity and death rates. Multitude of various parameter values which give no integral account of body is condition and its proximity to borderline areas "life-disease" and "disease-death" led to the primitive linear attitude to treatment. Unfortunately, this attitude is typical not only for patients. The terms "to bring the temperature down," "to reduce blood pressure" and other analogies had come into common use of mass culture of health. Thus, the valuable information remains unclaimed and goes directly in the archives or depending on the system of record

— keeping — in the dustbin. Could we perceive and completely understand this information, it would form the basis of very needed diagnosis which would allow, on one hand, to estimate the degree of health, i.e., the proximity to "health-disease" borderline from the left, and, on the other hand, to control the dynamics of rehabilitation in the course of treatment, i.e., the proximity to "health-disease" borderline from the right, from the disease side.

The above mentioned paradoxes of Microwave Resonance Therapy fostered the alternative approach to the problem of stability and functioning of the living systems based on the advances in modern natural science. Of paramount importance was our assurance that only transformation of medicine from empirical to fundamental science would provide the qualitative changes in the level of treatment, diagnostics and prevention of diseases. We succeeded in visualizing the outlines of solution for this extremely complicated problem making use of the acluevements in such sciences as quantum mechanics, nonlinear electrodynamics, non-equilibrium thermodynamics, field theory, synergetics, dissipative structure theory, and applying modern mathematics approaches such as theory of catastrophes, dynamic chaos theory, method of enclosed dimensions, etc. Hypothesis that lays claim to become a fundamental theory of the living matter is highly vulnerable. It must explain not only MRT paradoxes, but also all the phenomena stockpiled by traditional, nontraditional and folk medicines within the centuries. In biology the problem of tissue differentiation and formbuilding remains to be solved, in genetics — the problem of morphogenesis or, in general case, unraveling of genetic code retranslation mechanism, i.e., the realization of the program stored in DNA on the macroscopic level of an integral organism. The discovery of the "manifestation of characteristic eigenfrequencies in human body," which is the title of the paper published in 1984 in the "Reports of the Academy of Sciences of the UkrSSR" [14], established a starting point in creation of Quantum Physics of the Alive. Within the frames of this approach every macroscopic living object represents an integral macroscopic quantum-mechanic system whose multiform differential stability (distinction between and stability of species and

individuals) is provided by the standard rules of quantum mechanics: identity and discreteness, i.e., by the principles which maintain multiform differential stability on the other levels of quantum organization of nature: molecular, atomic, and nuclear.

In other words, the existence of periodic table as well as the possibility to identify different nuclei, atoms, and molecules (e.g., "nuclei of iron," "atom of hydrogen," "water molecule") account for the occurrence of general criterion of dynamic stability in the living and inanimate nature. From our viewpoint, these are the principles offered by quantum mechanics whose status allowed the approaches of nuclear, atomic and molecular physics to be referred to as fundamental. The occurrence of macroscopic quantum systems, though it is not a unique phenomenon (Josephson's effect), invites sufficient substantiation since we are not dealing with the applicability of certain characteristics, which usually describe a microscopic world: wave function, phase, etc., to a macroscopic object, but with the used complete formalism of quantum mechanics. This formalism includes the formation of self-consistent potential, its filling with energy levels, development of selection rules for interlevel transitions and metastable states, the existence of operators and eigen-values of observable quantities, life times level, the formation of bands of different nature, continuous and discrete spectra, modification of commutational relations, scaling of Planck constant $\hbar$ under special conditions, etc. The analysis shows only one formal condition for feasibility of quantum-mechanic approach to a whole macroscopic system, and two conditions to permit its universal passport — characteristic eigenfrequencies, are to be formed. The first condition consists in formation of nonlocal self-consistent potential for the whole object. The second — in the availability of selection rules which transform a quasicontinuous spectrum of transitions between single-particle levels, filling a potential well according to Schrödinger equation, into a discrete spectrum inherent in this object only.

A unitary macroscopic potential, where the processes provided in quantum mechanics may take place, is possible only in the presence of

certain long-range forces. It was mentioned above that such forces are not found in normal condensed matter. But, as it was outlined by H. Fröhlich (see [4]), they emerge as a certain effective long-range interaction in case of spatial-phase coherence similar to laser one. Therefore, to preserve the logic pattern of ideas of quantum macroscopic integrity of the alive we must assume the existence of body's coherent electromagnetic field in the range which corresponds to the observed characteristic eigenfrequencies (40-70 GHz) or, as it is often referred to, in "millimeter range" which, strictly speaking, is true only for vacuum or for air medium. Such assumption seems to be too bold at a glance, especially if the account should be taken of the real characteristics of medium where the oscillation propagation is assumed to take place. However, a more detailed analysis of coherence conditions in mm-range (in water medium at $h\nu << kT$) is much easier in practice as compared to optic range which is standard for lasers. The condition should certainly be observed that the inverse population of active centers is secured by pumping mechanism which in case of living matter is associated with metabolism (the openness of the system!) through the chain of structures "inserted" in each other and named by us "dissipative structure hierarchy" [15]. Because of this, if the cells, in which the physical term "inverse population" implies the capacity of being the source of electromagnetic radiation in general case of complex amplitude-frequency-phase composition, are regarded as active centers on the level of an organism, then the lower levels of hierarchy should, in the long run, provide the translation of all the magnitude of hereditary information stored in DNA into the language of electromagnetic oscillations.

This problem still remains to be completely solved. However, even the semi-quantitative — semi-qualitative estimates, analysis, and calculations which have been carried out for the whole organism as well as the last experimental and theoretical data accumulated by specialists who study traditional objects of living and "pre-living" nature-nucleotides, DNA, aminoacids, cell membranes, proteins, cells, unicellular organisms, Drosophila, animal subjects, plants) permit the statement that the ideas of Physics of the Alive are truly adequate to

the real world in which the living matter represents the level of quantum organization of matter following the molecular one.

Combined analysis of standard analytical relations of quantum physics and radiation theory shows that the ratio of induced and spontaneous radiation probabilities within the system "matter at temperature T with inversely populated double-level centers — field with resonance frequency $E_2 - E_1 = h\nu$" has the form of $\frac{P_{stim}}{P_{spont}} = \frac{1}{e^{h\nu/kT} - 1}$. In case of optical range which is common with lasers, at $h\nu << kT$, it leads to the well-known technical problems of providing the conditions for non-equilibrium phase transition in order to achieve a regime of coherent electromagnetic wave generation.

On the other hand, at room temperature within the mm-range $\frac{h\nu}{kT} \approx 0.01$ and therefore $\frac{P_{stim}}{P_{spont}} \approx \frac{kT}{h\nu} \approx 100$, i.e., the transition into coherence regime is essentially facilitated at the expense of thermal bath, provided that the inverse population regime is maintained by metabolic pumping on all levels in the hierarchical chain of body dissipative structures. Hence, despite the substantial mm-wave absorption in the water medium of the body, the latter can preserve maser regime of functioning as an integral whole even in case of photon leakage from the "electromagnetic frame" through the BAPs [16].

The mechanism of formation of self-consistent electromagnetic potential of a whole organism is worth to be considered separately. Beyond the threshold of non-equilibrium phase transition we shall regard only undamped periodical wave structures, the so-called Poincare limit cycles, from the variety of emerging, expanding, and decaying patterns of system coherent waves.

It can be shown that the existence of stable limit cycles space potential profile in which the conditions for quantum-mechanic macroscopic system description.

The origin of synergetics as a modern science concerned with self-organization is usually associated with the name of G. Haken,

whereas its physical foundation was laid, as has already been mentioned, by I. Prigogine, who specified the basic role of system's openness and its dynamic nonlinearity in the deviation from equilibrium thermodynamic branch.

Following Haken [17], we shall demonstrate the interrelation between limit cycle and self-consistent potential, which is appropriate for quantum-mechanic description of the living matter.

In the very general case the equation of vibrational motion in the system described by parameter q is given by

$$m\ddot{q} + \gamma\dot{q} + kq = 0, \qquad (13)$$

where the second and the third terms in the left-hand-side respectively determine the breaking $(-\gamma\dot{q})$ and the motive $(-kq)$ forces of the oscillator.

In the "overdamped" state, when the strong coupling with the environment blocks the existence of real vibrational processes, the first term in the equation (13) is neglected and it is reduced to the form of

$$\gamma\dot{q} + kq = 0, \qquad (14)$$

or in the general form under the scaling of time axis $t = \gamma t'$ it has

$$\dot{q} = F(q). \qquad (15)$$

Here the potential $V(q)$, which as usual is connected with the force by the relation $F(q) = -\dfrac{dV}{dq}$, is introduced by Haken for the illustration.

Indeed, if as the force one will take the force of harmonic oscillator $F(q) = -kq$, the potential $V(q) = \dfrac{kq^2}{2}$ will be obtained accurately to a constant component. The plot of this function shown in Fig. 2 allows the potential curve to be interpreted as the slope of the hill for a certain body which is positioned on this slope. At the point q=0 the force acting on the body disappears, and the equation (15) gives $\dot{q} = 0$, i.e., at any deviation from the point q_0 the body returns to the stable equilibrium state q_0=0.

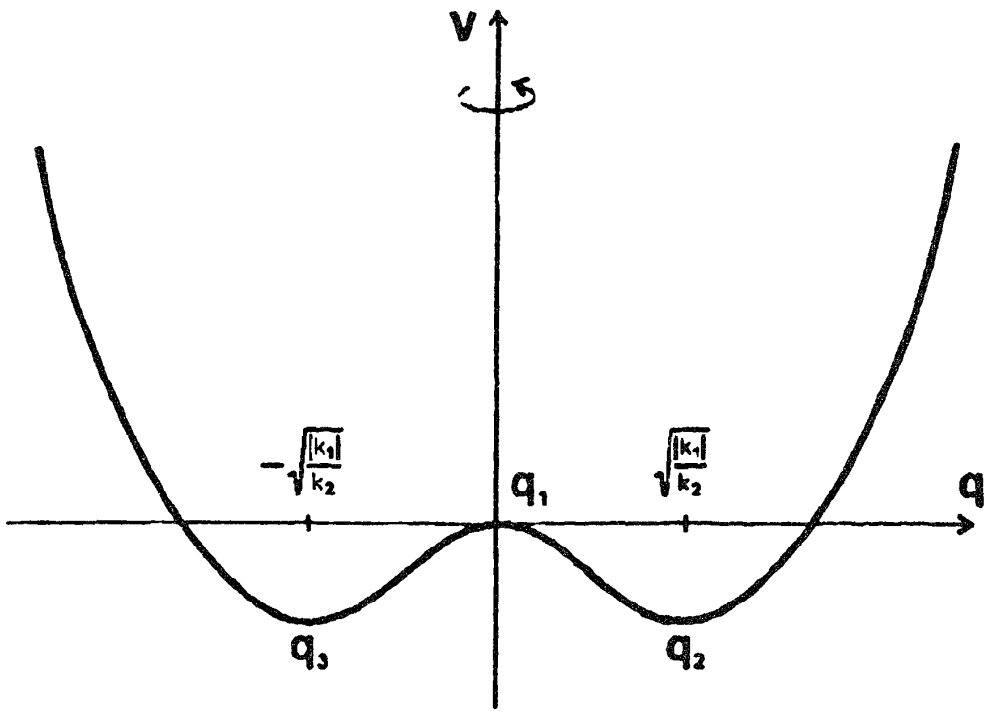

Fig. 2 The Landau-Haken potential whose origin in a self-organizing system accompanies the limit-cycle solution of the nonlinear differential equation $\dot{q} = -kq - k_1 q^3 (k < 0, k_1 > 0)$

Even more demonstrative is the two-dimensional problem, where the pattern in Fig. 1 makes a 360° turn around the y axis. In this case we obtain a tube-like vessel with the upward extension, so that the stable equilibrium in the center of the bottom for the drops running down by walls is evident.

(The behavior of the water drop which wets the glass and runs down the walls of the tube is more adequate to the processes described by the equation (14, 15) than the behavior of a solid ball which rolls down the hill, because in the latter case the first term of the equation (13) cannot be fully neglected, and the motion of the ball will have the form of damping vibration around the point q_0.)

Self-organization processes, as mentioned above, are determined by medium nonlinearity which must naturally be embodied in the nonlinearity of the equation describing the dynamics of medium behavior. The simplest nonlinear additive to the motive force of harmonic oscillator at which the invariance of equation (15) at $q \to -q$ and potential axial symmetry are retained is provided by cubic term, i.e.,

$$F(q) = -kq - k_1 q^3. \tag{16}$$

and

$$V(q) = \frac{kq^2}{2} + \frac{k_1 q^4}{4}. \tag{17}$$

Therefore,

$$\dot{q} = -kq - k_1 q^3 \tag{18}$$

with the equilibrium condition determined as $\dot{q} = 0$ In this case we obtain two qualitatively different situations with respect to the sign of parameter k:

a) $k>0$ and $k_1>0$.

The potential has no qualitative distinctions from the one in Fig. 2; there exists one stable equilibrium position at $q=0$

b) $k<0$ and $k_1>0$.

There exist three solutions to the equation $\dot{q} = 0$. one unstable at $q_1=0$ and two stable at

$$q_{2,3} = \pm\sqrt{\frac{|k|}{k_1}} \tag{19}$$

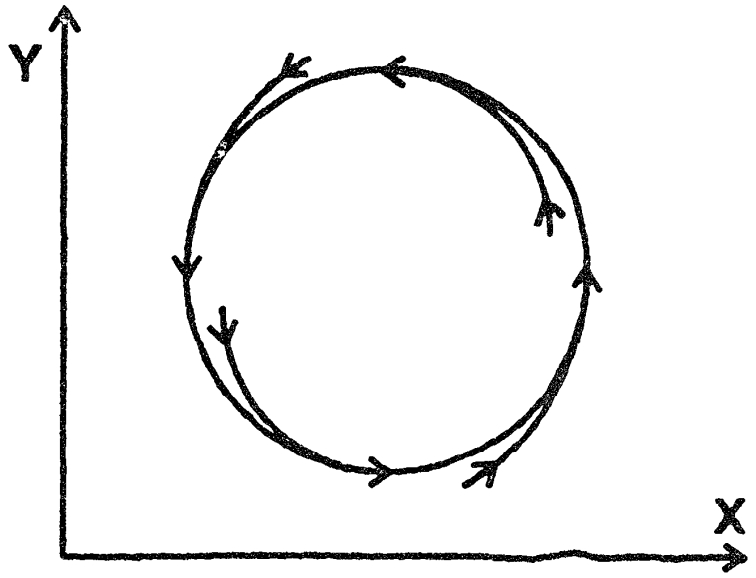

Fig. 3 The limit-cycle solution of the nonlinear differential equation $\dot{q} = -kq - k_1 q^3$ ($k<0$ and $k_1>0$) in phase plane $(q_1 - q_2)$

and the potential under the transition of k through zero takes the form shown in Fig. 2. Under the transition from one-dimensional to two-dimensional problem it is necessary to turn this curve around the ordinate axis. Thus we shall obtain the pattern similar to bottle bottom. Displaced by random (fluctuational) force from the unstable equilibrium position ($q_1=0$) the body descends along the

helix to the area of potential energy minimum, and it will make rotational motions along the "bottle bottom" cannel described in polar coordinates by equations

$$\begin{aligned} \dot{r} &= F(r) \\ \dot{\varphi} &= \omega \end{aligned}, \tag{20}$$

or (which is equivalent)

$$\begin{aligned} q_1 &= r\cos\omega t \\ q_2 &= r\sin\omega t \end{aligned} \tag{21}$$

This periodical motion of the system performed in phase plane in general case is referred to as a limit cycle. Mutual correspondence between potential's form and the character of the system's behavior in nonlinear medium (limit cycle) introduced by Haken only to illustrate the process of self-organization in terms of mechanics, conventionally used by physicists, is indeed of fundamental importance.

The matter is that in dissipative system with active centers which serve as the sources of electromagnetic waves with identical spectral composition, beyond the threshold of nonequilibrium phase transition, i.e., at the emergence of coherence (along with the effective long-range forces), in the medium there may appear many types of waves of collective nature, the theory of nonlinear differential equations permits to classify the structures that emerge in these conditions with respect to medium parameters. The majority of solutions obtained describe the structures whose form in the phase plane either changes with time or is unstable toward small perturbations. Among these are the solutions which derived special names from the peculiarities of trajectories' behavior around the specific point on phase plane: focus, nod, center, saddle, etc.

There exists however a special class of solutions periodic with time which are represented in phase plane in the form of closed curves (circle is a particular case) and bear the name of limit cycles.

Therefore, if in the coherent system there emerged a stable limit cycle (Fig. 3), it meant that the potential of the type seen in Fig. 3 had been formed, i.e., the potential which attracted the solution trajectories both from the large and from the small radii. It was the potential

which was necessary to describe the living system as a whole quantum-mechanic object.

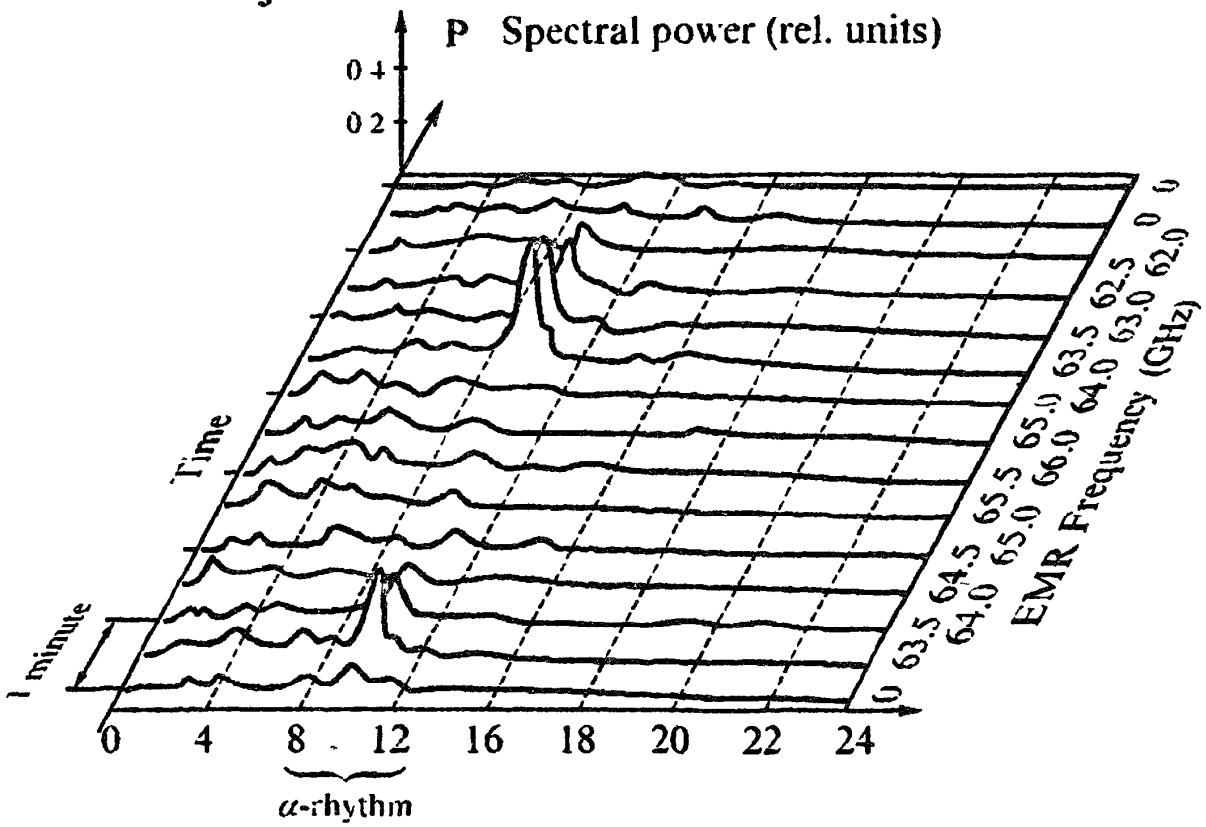
P Spectral power (rel. units)
0.4
0.2
Time
1 minute
0 4 8 12 16 18 20 22 24
α-rhythm
Fourrier expansion frequencies of EEG (Hz)
EMR Frequency (GHz)
0 63.5 64.0 64.5 65.0 65.5 66.0 63.5 64.0 64.5 65.0 65.5 62.0 62.5 63.0 63.5 64.0 64.5 65.0 65.5 66.0

Fig. 4 Variation dynamics of harmonic components of EEL of patient "P" subjected to the procedure of "therapeutic frequency" search

Hence evident is the concept of Chinese meridians as coherent running electromagnetic waves which form the limit cycles. Chinese meridians, therefore, are of electromagnetic nature. They are incorporated into the body's "electromagnetic frame" which is created by its every cell and also ensures its variable differential stability being a bearer of gene information.

This dual approach used in Physics of the Alive when any living organism is at one time regarded both as a whole quantum-mechanic object and as a stable dissipative structure which arises and functions in the hierarchical chain of dissipative subsystems due to the connection of the order parameter of one level with the control parameter of the other level, appeared to be productive at reverse motion along the Weisskopf quantum ladder — from the living systems to atomic nucleus.

Thus we managed to solve a number of methodological problems which had been a challenge for many years both in certain "fundamental" sciences and in the quantum mechanics itself [18].

It is this event that gives hope to consider the above approach to creation of fundamental science of the alive to be useful.

However, apart from the satisfaction resulting from the fact that the suggested conceptual bases of Quantum Medicine helps the idea of the alive to fall into the picture of the world created by modern natural science, there is a number of first-hand data which form the core of this conceptual shell.

In view of this I would like to make a note. Quantum Medicine being a study of rehabilitation of human body functional condition on the basis of the ideas of Physics of the Alive has not been created in the bland space. Actually all human advancements in scientific empirical cognition of the living matter as well as all the experience of the folk "mystical" and "scientific" successful healing must find the explanation from the standpoint of Quantum Medicine and Physics of the Alive. And there should not be any exception, it is impossible to "hide" behind the "helpful" statistics both for the observed phenomena of the living nature and the efficacy of treatment. The latter statement needs explanation. The matter is that we cannot make a flippant statement that today the suggested approach can explain all the phenomena of the alive (psychic activity included) or cure all the patients. However, the properties of the living matter s h o u l d n o t c o n t r a d i c t to the conceptual bases of Physics of the Alive, and a l l the systems with functional disturbance should have a r e s p o n s e to mm-range EMR within MRT regime. The presence of a sole exception would be fatal for all the edifice of Physics of the Alive as a fundamental science, and Quantum Medicine would become one more effective method of physical therapy or "non-invasive electroacupuncture."

In the same time the knowledge accumulated by the traditional sciences which study the living nature such as biology, biophysics, genetics, medicine, biochemistry, immunology, molecular biology, embryology on one hand and by such fundamental sciences as nuclear,

atomic and molecular physics (spectroscopy in particular) on the other, is inestimable as a source and in many cases as a ready experimental material for Physics of the Alive and Quantum Medicine. It means that many experimental results necessary, e.g., to specify the models of Physics of the Alive can be found in the annals of biophysics, especially if the studies were described with the accuracy required by P. Kapitsa many years back. In medicine the situation is the same: comparative analysis of success rate for the same diseases treated with drug-therapy, traditional acupuncture, laser, electroacupuncture, moxibustion, homeopathy, magnetotherapy, etc. can be very useful for the elucidation of interaction mechanism of "electromagnetic" and "biochemical" frames of a man, and for the search of the ways for patient's quantum system to change its metastable state, and to trace the dynamics of symmetry restoration in self-consistent potential. Because of this, when the experimental data of Physics of the Alive are discussed, they may not necessarily be obtained by the author himself. An example may be offered by a meridian topology which has come down to us through the centuries from Ancient China and which was analyzed from the viewpoint of nonlinear electrodynamics (see [16]), or body's morphological structure studied from the point of view of stable quantum-mechanic orbitals (see [18]), or papillary pattern on the digits, palms, and feet analyzed by wave optics [19], or the system of visual perception and image memorizing examined from the standpoint of the information convertion from the optic (visual) to the mm-range (body's characteristic eigenfrequencies range) [20]. To these studies based on well-known facts stockpiled in different laboratories for many years, numerous theoretical studies in Physics of the Alive can also be assigned. In the first place the proof of self-consistent nature of bistable regime of the ion channel passing through cellular membranes [21] should be mentioned as well as the explanation of the mechanism of action of extremely low levels of radiation on the living subjects from the point of view of disturbance of genetic code [22] retranslation regime and collective nature of "resonance" perception mechanism offered by the living objects under mm-range EMR of low-dose level [23].

From the numerous experiments which determined our present view on the problem of the living matter one may underline the following: the discovery of resonance features in the mm-range EMR effect on the body (see [11]), conformational genome state [24]. and aminoacids [25] and (of primary importance) the revelation of conditions of their reproducibility (see [9]); the study of power dependence of these [26, 27] and treatment effects [28] in the quantum limit range; the examination of changes in the electrical activity of cutaneous tissue in the biologically active points in patients and in health subjects [1, 29, 30], the elucidation of the influence of circular polarization orientation on the nature of resonance features at mm-range EMR action upon the biological objects and MRT heal rate, which resulted in the introduction of quantum-mechanic selection rules on helicity in Physics of the Alive [31]; the investigation of peculiarities of water behavior under the conditions approaching the body ones [32] and receiving arguments in favor of determination of its role in it as that of "physical vacuum" [33] which provides the living systems with the regime of stable dissipative system; holographic studies of the regimes of collective behavior of blood plasma in the mm-range field are close to the investigations [34].

In conclusion I would like to return to the problem of diagnosis. The new concept of the stability of the alive suggested by Quantum Medicine permits a new approach to the problem. The idea of this approach consists in the following.

Modern medicine possesses the enormous diagnosis potential. Modern devices which perform in-line with computers can give the information on the hundreds of organism's data, their dynamics, correlations, etc. However, the nonlinearity of changes in each datum in the course of treatment. which accounts for nonlinearity of the living system itself. does not allow in the most cases to adequately control the process of treatment by the dynamics of certain isolated parameters. The essence of a new approach to the problem of diagnosis consists in finding certain generalized parameters of collective nature according to which the body's condition could be estimated as a whole. To be universal this approach should work irrespectively to the

category of parameters we regard as initial data. Specifically, the conclusions given below are based upon two classes of measurements: cytochemical blood indices (A.S. Yanovskaya) and pulsigrams measured according to the recommendations of Ancient Chinese medicine (V.Ye. Lobarev et al.). The search for such generalized parameters was motivated by the ideas of Physics of the Alive and synergetics that the level of the living system integrity depends on its state, i.e., it must increase with the recovery. It should be seen in the lessening of the informational entropy in accordance with the Klimontovich *S*-theorem and in the decrease of dimensionality of generalized phase space which describes the body as an integral entity.

The new diagnosis brings into use the vector of patient's condition and the analysis of this vector behavior in the phase space of its generalized characteristics. The analysis begins with the preparation of experimental table of $N \times M$ dimension, where N is a number of patients, M — their real (e.g., cytochemical) indices obtained before treatment. The computational algorithm of organism condition representation by means of experimental table is based upon Korunen-Loev expansion of corresponding correlational table (matrix) which is routinely obtained with the use of transposed matrix of the experimental data. Actually the process of matrix diagonalization allows the eigenvalues of the living system, which determine the coordinates and the enclosed dimensionality in state space, to be obtained.

If the experimental table is processed after the effective treatment (e.g., by MRT), it appears that the included dimensionality is decreasing or, which is the same, the contributions of the first components into the observed general dispersion of the states are increasing. In other words, if prior to treatment the mass contributions of every unit vector of the state vector were comparable, after treatment their redistribution was observed and the vector almost completely (to 80%) fitted in a two-dimensional space.

The utilization of the catastrophe theory approach to predict the results of treatment even after the first or the second MRT session was the next step in the development of Quantum Medicine diagnosis. There are reasons to believe that in the studied phase plane the transi-

tion trajectories from pre- to post-treatment condition are connected with the development of one of the components of two-dimensional variability of fold-type singularities on this plane. The profiles of this singularity displayed in the form of potential wells determine the permitted and prohibited ways of motion of patient condition vector in the course of treatment. In case of wrong prescription when the condition vector passes toward the "potential trap" it is possible to correct the treatment regime by the orientation of patient condition vector around the prohibiting singularities of phase surface. Detailed mathematical techniques and experimental data processing applied for diagnosis in Quantum Medicine are given in the Appendix [31].

The above conceptual bases of Quantum Medicine stem from the latest advances of modern fundamental natural science, and it gives hope to see the radical changes in prevention, diagnosis and treatment of human diseases.

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Chapter 2

Traditional Medicine Today: Problems and Expectations

Recent years have seen noticeable changes in public health service and medical and biological researches. A rapid progress in the sciences related to living matter is being accompanied by a development of medical equipment and methods. This has brought about a considerable extension of potentialities in diagnosis and therapy of diseases and an increase of human lifetime. Basically new concepts in biology and medicine have been developed along with a constant improvement of traditional approaches.

The World Health Organization (WHO) in 1982 formulated a program of evaluating the state of public health protection and the trends of its development. In the years that followed, this program acquired a new goal, i.e., achievement of health for all. This is, surely, a long-time and difficult task. State organizations and experts have to tackle complicated problems of many fundamental aspects in biology and medicine apart from the problems of sanitary statistics and epidemiological inspection which have been the main concern of the WHO programs. The problems to be solved include non-traditional, alternative approaches in combating the most serious and incurable human diseases.

The general trend toward changing morbidity patterns in the civilized world is a constantly decreasing number of infectious cases and an increasing frequency of cardiovascular diseases, malignant tumors, and autoimmune diseases.

The cardiovascular diseases are the main cause of untimely death in the majority of developed countries, causing up to 50% of lethal cases in the age group of 35 to 64 years. Kazuo Uemura and Zbynek Risa (1990) studied trends in death rate caused by cardiovascular diseases in developed countries after 1950. Compared with prior publications in this field, the researchers studied a more extensive age group (30-69) and used age-standardized mortality figures per 100,000 inhabitants. Death rate of both sexes was especially high in the United Kingdom, Ireland, Scandinavian and Eastern-European countries and low in some countries of Southern Europe, France, and Japan.

There are no doubts that an atherosclerotic lesion of the coronary vessels and arterial hypertension are responsible for aggravation in the course of coronary disease. Internal mechanisms of development of atherosclerosis and hypertension are complicated and are not completely known. Hypothalamic-hypophyseal axis disorder and disorders of lipid metabolism are the components that can be spotted on the surface and are more or less uniquely interpreted. Moreover, the mere fact that the pathogenetic mechanism of arterial hypertension is interweaved with obesity mechanisms is being stressed now. Due to increased metabolic requirements, obesity involves an increase in cardiac output since stroke volume becomes greater. This inevitably leads to higher resistivity of peripheral arteries, i.e., arteriospasm, and to an abrupt rise in the minimal tension. A still greater stroke volume is the response. The aforesaid, to be sure, does not rule out the importance of genetic and environmental factors, changes in cell membranes, involvement on the endocrine system, etc. But it is evident that obesity is one of the efficient components of the pathogenic mechanism of essential hypertension, which can be corrected and therefore are essential for prophylaxis. It is not by chance that the World Hypertension League declared that loss of body weight is followed by improvement in some metabolic and hemodynamic characteristics apart from a decrease in the arterial pressure. It should be noted that in 1989 "Guidelines for the Management of Mild Hypertension: Memorandum from a WHO/ISH Meeting" (WHO, 1989) emphasis is placed

on non-pharmacological treatment which could be applied to about 20% of cases.

Considerable advances have been made in the heart surgery. Operations for aortocoronary veins bypass, the correction of congenital heart disease and acquired heart valvular diseases help to prolong life and working capacity of hundreds of thousands of people. Radiovascular dilatation method, first proposed in 1964, was used worldwide in the last decade. In the USSR, a major contribution to the development and extensive use of the method was made by V.S. Savelyev, V.I. Prokubovsky, A.Ya. Farber, I.E Rabkin and others. The radiovascular dilatation made it possible to decrease sharply acute thrombosis rate which is very high during angioplasty of femoral, subclavian, and iliac arteries. The radiovascular dilatation proved to be a good method for renal arteries and a choice method of treating renovascular hypertension. Big national medical centers propose their inventions to the patients with arrhythmia running a higher risk of lethal outcome. A broad experience has shown that implanting of defibrillators results in persistent survival of people and permits to prolonge the patients' life.

Removal and transplantation of human organs became a routine in medical practice but caused many ethical problems since the definite layers of population in many countries due to religious or other reasons condemn sharply such an interruption. In order to prevent excesses, Ministries of Health in a number of countries insist on creation of national registers for civilians who oppose removal of organs from corpses. Moreover, a complete network for trading organs taken from the poor was uncovered. This has caused strict legislation.

Another approach to the problem of transplantation is possible, e.g., the organs taken from animals. A great interest in reports on transplantation of the heart and of the liver of baboons to humans was aroused. However no success in suppressing rejection with both homologous and heterologous drafts was reported and the search for combination of immunosuppressive preparations continues. Immunosuppressive therapy as such is fraught with immediate and remote complications since a much required immunologic supervision is being artificially hindered.

In recent years there is noted a worldwide increase in the rate of coagulability-related diseases. Ch. Owen (1984) from the Mayo clinic points out that one of the major causes of high morbidity and death rate of humans are thrombosis and thromboembolism (these include a wide range of diseases from myocardial infarction to loss of sight) which cause death five times more often than that of cancer.

A number of pathologists advanced a hypothesis of a hemostatic balance according to which a process of blood coagulation in a human organism became prevalent and as a result a constant fibrination process takes place in blood (A.I. Strukov, S.M. Strukova. 1982). The blame is mainly on hypodynamia, intravenous injections, blood transfusion, antibiotics. Of particular interest are stresses accompanied by adrenaline release in blood as well as fats and cholesterol.

In order to support some of the assumptions of this hypothesis many experiments were carried out on animals having transplanted tumors. Administration of fibronilizine prior to transplantation of tumors appeared to be notably hindering their growth, while in some cases preventing the tumor development. It seems reasonable to take high coagulability as a risk factor for malignant tumors apart from myocardial infarction and thromboembolic insults.

It has not been long ago that mankind celebrated elimination of smallpox all over the world. Nevertheless it so happened that the virus of the genus Orthpox virus in monkeys of Western and Central Africa became a causative agent of a similar human disease, which have rise to a problem of an obligatory antismallpox vaccination in the risk groups (L. Khodakevich et al., 1988).

Many widespread diseases, especially those in children, are caused by viruses of the family of paramyxoviruses, specifically by respiratory synugial virus, by the viruses of parainfluenza type 3 and of measles. Beginning from 1983 the WHO initiated a Program to develop vaccines against acute respiratory and viral diseases in children. The use of recombinant viruses, gene vectors of a number of virus proteins produced promising results. At the WHO Expert Advisory Panel on Molecular Biology of Influenza Viruses (USA, 1989) it was revealed that animals, especially birds, are the source of a variety

of pathogenic viruses of influenza. It was accentuated that there was a need to study aminoacid and nucleotide sequences in the said viruses as a molecular basis of pathogenicity.

The most widespread bacterial diseases in the countries of temperate, tropical, and subtropical climates are those induced by pathogenic Streptococci. The diseases include rheumatoid endocarditis, glomerulonephritis, pneumonias, sepsis, a number of purulent diseases and possibly caries (Str. mutants). Chemical structure of M protein in Group A Streptococci is largely decoded, no new approaches to prophylaxis and treatment of a many-sided Streptococci infection appeared and these diseases will remain a major problem for decades to come (L. Rudin, 1987).

Among successes of the modern medical practice an eradication of malaria in many countries can also be found. In Armenia in the '20s and '30s, at regions of the marshy Ararat valley malaria took tens of thousands of human lives. But the problem of malaria has not yet been solved. Malaria remains a common disease in about 100 countries, with non-consistent information coming from many regions. By general estimates, 11 million cases of malaria arise and about 270 millions people catch plasmodium malariae (World Health Statistics Quarterly, 1990, 43(2):68-79). European tourists who intent to travel through tropical Africa are proposed chemical prophylaxis. Nevertheless, such common antimalarials as amodiaquine, chloroquine and PIC/SDC gave adverse responses with individual lethal outcomes in 11-14% of the tourists.

Poliomyelitis cases are going down, mainly, due to the intensive use of peroral trivalent attenuated vaccines. In some countries, however, where vaccination is widespread, poliomyelitis epidemies still arise. In this connection the question of the day is a thorough planning of tests of vaccines in humans since postvaccine paralytic complications are becoming more frequent. A global eradication of poliomyelitis is possible as early as 1995 naturally as a result of intensive efforts and ever growing international cooperation (Hinmar A.R. et al., 1987).

It was a decade ago when humankind was certain that communicable diseases are no more seriously dangerous for civilized countries. Still at the beginning of the '80s a new viral infection that seized 124 countries in 1987 was identified. Actually it was an AIDS pandemia. It is to be noted that HIV is a representative of a group of retroviruses many of which are cancerogens.

An attempt to make prognosis for AIDS morbidity rates within the next 5 to 10 years was undertaken. In view of the fact that the latent period from acquiring HIV to AIDS manifestation lasts 8 to 9 years, those who will develop AIDS disease within the next 5 years became infected with HIV in 1987. Statistical extrapolation of empirical curve describing the number of registered cases gives grounds to assume that from the middle and the end of the '90s the number of AIDS cases will reach 3 millions (Chin J., Mann J., 1989).

The negative consequence of the sexual revolution that spread through many countries was sexually transmitted diseases propagation, especially among people of 15 to 50 years of age as well as in babies. In industrial countries sexually transmissible diseases rate peaked during the W.W.II. Further on there were several rises and drops. Beginning from the end of the '70s and to the present time a decrease in the mentioned rate has been noted. Apart from the traditional bacterial infections the major problem includes diseases induced by genital herpes and papillomaviruses of humans, which diseases are associated with rectum and cervix uteri cancers.

Refugees, in their turn, have increased the spread of communicable diseases. R.S. Moore et al. (1990) called attention to the fact that several large refugee populations who lived previously in the areas with high endemity as to the meningococci infection were the cause of an outburst of epidemic cerebrospinal meningitis. The same is valid for a number of other highly contagious infections.

Within the last 20 years percentage of deaths as a result of various diseases was relatively constant. Death rate from malignant diseases is an exception. Thus, for example, in France in 1990 malignant diseases were the cause of 25% of deaths against 20% in 1970. The same picture is characteristic for some other countries. One of sub-

stantial features of the increase in the morbidity rate and the number of deaths as a result of malignant tumors is a general prolongation of life. In India, for example, in 1941 to 1951 mean lifetime was 32.1 years and cancer was unlikely to be a real hazard in the sense that people did not survive until its clinical manifestation. In 1951-1961 the lifetime increased to 41.3 years, while in 1971-1981 it was 50.5 years (Family Welfare Program in India, 1984).

About a third of all the cancer diseases is assumed to be related to smoking. At Tokyo Cancer Institute it was shown that active radicals that are present in the tobacco smoke cause breakage of one of the double spiral of deoxyribonucleic acid in the cell nucleus. The condensate of tobacco smoke of a cigarette is estimated to cause several thousand such breakages per second. The majority of these breakages are remedied by the living cell. But in course of time the cell looses its ability to remedy the breakages while anomalous chromosomes that appear lead to malignance of the bronchial epithelium. Though this fact is an evidence of a discovery of a mechanism of initiation of lung cancer at the molecular level it has to be remembered that in pathology it does not cause always equal effect and is insignificant for understanding the essence of phenomenon. That is why, as correctly noted I.V. Davydovsky (1969), etiology of tumors is more extensive than a single causative factor (cancerogene, oncogenic virus, radiation) and even a group of factors, it is based on very complicated interrelations of a reagent and a reacting substrate.

Among the factors causing cancer are also nervous stresses. The only fact that no animals can be compared with man as to an increase in the morbidity rate with malignant tumors, suggests that neuropsychiatric factor is indisputable. It should be noted that this idea is not new. It was Galen (2nd century A.D.) who thought melancholy to be one of the causes of cancer and attributed its initiation to "the rage of a beast inside ourselves." The last decade saw an establishment of a complete teaching about an influence of negative emotions and characterologic features of a personality on the causation of tumors. People who are reserved and do not express rage or indignation more often

develop cancer. Negative emotions and depression have already been determined as having a retardation effect on immunologic responses.

A cancerous cell, as an antigen, is alien to the human organism. Mechanisms of immunity to heterologous structures have being made up for centuries. In the course of evolution the immune system became capable of recognizing heterologous and proper antigens in a subtle and faultless way. Recognition is closely related to such an important organ of immunogenesis as thymus where T-lymphocytes get mature. T-cells are capable of instant recognition of heterologous substances and making an attack on them. And with an object of having the attack strictly specific and purposeful the surface of these lymphocytes is provided with special chemical structures, namely, receptors. In the course of scanning electron microscopy of tumors on the stomach, bladder, and ovaries we often observed macrophages and lymphocytes, having globular shape with lightly granular surface, which showed cytoplasmic bridges extending toward the tumor cell and enveloping it to have it isolated and lyzed.

Extremely specific receptor system is an integral part of an organism providing for its vital activity, otherwise T-cell will attack normal tissue structures of their own organism and there would arise a pathologic condition known as autoagression.

The lymphoid system is multiformous. Among T cells there are: an auxiliary population which enhances activity of the antibody-produced B cells that are getting mature in the marrow, killer cells, and the cells that inhibit the process of destruction of heterologous structures.

In 1983 the Nobel Prize was awarded, as an exception, for applied photography rather than for a scientific discovery. A Swedish photographer showed his wits to develop a device for making and made photographs inside the human body at the cellular level. He made a needle-like objective (connected to the microscope by means of a waveguide) and used it to penetrate into the capillaries of the lung affected by a malignant tumor and to fix the fight of a lymphocyte against a cancer cell. A number of photographs shows the lymphocyte attacking the cancer cell by extending a spike and destroying the cell.

One lymphocyte consecutively made lifeless five neoplastic cells. It was for the first time that the struggle of human defenses against a perfidious disease was shown within a living human organism. One cannot but remember the prophetic words by W. Shakespeare, "Our medicine is often within ourselves."

With ageing T-lymphocytes more often make errors in cancer cells recognizing. It is due to the fact that the thymus gets gradually atrophied and also is open to injury with various endocrine deviations due to age. But a depressive action on the immune system of those factors that are inalienable attributes of the modern life is the most significant in that the cells are more often getting free of immunological supervision. They sharply increased the risk of tumors. That is why technological progress should be wisely obstructed where it is harmful for human health and for environment.

The clue to the cancer problem is in a discovery of some pathological and physiological processes. Flat and round worms are well known to parasitize in the human organism for a long time. Take, for example, echinococci as a pathology typical of Armenia and many other hot countries. Clinicians and pathologists often come across a phenomenon that echinococcus vesicles vegetate for years in the liver or lungs without rejection by the organism. The parasites have been found to release immunodepressants such as trichinelline. There is one very interesting thing that strikes us, i.e., trichinelline, as a highly selective immunodepressant, inhibits thymus-dependent lymphocytes (responsible for tissue rejection) but has no influence on the production of antibodies. So, there is a selective and balanced inhibition of immunity instead of whole body resistance. This suggests that lasting evolution crystallized biologically appropriate forms of adaptability of an organism.

It is to be noted that the immune system is capable not only of rejection but on the contrary of safeguarding heterologous. In a report at the meeting of the directors of oncological and radiological institutes in June, 1985 the Academician of the Russian Academy of Medical Sciences N.V. Vasiliev said that in pregnancy the immune response is aimed at safeguarding the fetus, as not self in self, despite

an obvious antigen heterologous nature. The fetus is guaranteed "the most favored one status." This "immunologic paradox of pregnancy" is supposed to be related to retardation of some members of the immune system of the mother. The speaker notes that there is no complete "immunologic disarmament" because the mother needs a reliable antiinfection defense while she is carrying her fetus. But immunological tolerance, while malignancies grows, is self-destructive. Its nature has not yet been disclosed. Probably, carcinoembryonic antigen, which is expressed on membranes of neoplastic cells and can simulate a developing embryo, is of some importance.

Patients with malignancies have no total immunodepression. That is why N.V. Vasiliev concludes that improvement in immunity is not appropriate, instead what is needed is rearrangement of immunity, i.e., switching with suppression of suppressor lymphocytes the number of which increases with age. Therefore the judgments about immunity activation seem very plain-spoken and vulgar. Some antibodies stimulate tumor growth, the same effect is characteristic for individual populations of lymphocytes and macrophages. These matters are so complicated that the warning against "a rude, manual interference" in the system of immunologic homeostasis, seem rightful. Hyperactivity, as related to the immune system is very far from being justified, especially with immunotherapy by allergens. P.S. Creticos. P.S. Norman (1987) found that the immune system, being subjected to immunotherapy by allergens, undergoes a series of changes. It is conceived that synthesis of IgE is normalized. blocking antibodies are produced, reactivity of effector systems is decreased. Eventually only individual patients affected by allergy demonstrated an increase in clinical manifestations. This example has no relationship to carcinogenesis and is set forth to demonstrate risky methods by physicians at times.

In the pattern of morbidity and deaths caused by malignant neoplasias, such severe disease as lung cancer comes first. Colorectal cancer and cancer of large intestine ranks second in industrial countries, while in developing countries it takes the eight position. On the whole colorectal cancer is the third of most spread diagnosed malignant neoplasia which is almost equal to mammary gland cancer, i.e.,

about half a million new cases each year (D.M. Parkin, 1988). As far as it is colorectal and cancer of large intestine that causes a peculiar discomfort in the life of cancer patients the World Health Organization in 1985 organized the Sloan-Kettering Memorial Cancer Center in New York as WHO Collaborating Center for this kinds of cancer prevention.

Among the diseases that directly or indirectly relate to urbanization and increase of life quality is also diabetes. Registers of insulin-dependent diabetes mellitus have become an important instrument for evaluation of clinical features, making our knowledge of etiology and pathogenesis more profound. In recent years a strict register of new cases of this disease is being kept among children and young adults. The morbidity rate appeared very diversified, from 28.6 and 23.6 per 100 thousand population of Finland and Sweden to 4.0 and 1.3 in Kuwait and Japan (Mason D.K., 1987).

Medicaments are becoming more important in the life of people year after year. Due to the fact that medicamentous pragmatism is not always justified, a problem of overuse of medicaments has arisen. Trends which are being set both in public and private sectors are constantly analyzed on national and global levels. In many countries people face the problem of under supply of pharmaceuticals because they are inaccessible to wide sections of the population, which is due to high costs of their production. On the other hand, since pharmaceutical production infringes upon the interests of many people, there have been an urgent need for monitoring pharmaceutical policy, especially in that what relates to an increase in the quality and safety of medicaments and for giving up the policy of achieving only commercial aims.

Use of drugs irrespective of actual need in them as well as their palliativity results in an increase in a number of patients suffering from drug abuse. Some medicinal agents posses strong immune suppressive properties; for instance, widely used glucocorticoids attenuate phagocytosis. Some modern drugs deteriorate immune response which may be a more effective agent than the drugs. Adequate agents for immune therapy are not available either. Even a widely used BCG

stimulates both T-killer cells and T-suppressor cells. Finding ever increasing application in modern society, oral contraceptives are not an uncommon cause of venous thromboembolia, thrombotic apoplexia and myocardial infarction (Stadel B.V., 1991).

By and large, pharmacotherapy is open to various complications subdivided by I.P. Zamotayev (1991) into two types: the first type is due to manipulations in conducting pharmacotherapy (thrombosis, phlebitis, subcutaneous necroses, injectional abscesses, etc.), the second one is due to pharmacodynamics of drugs (shock, collapse, orthostatic and toxic responses), as well as bronchial spasm, bradycardia, acute urine retention. Medicinal agents can also contribute to revealing of silent diseases. Problems of medicamentous therapy are also related to the fact that most of physicians are not able to make tail or head of synergic effect, i.e., enhancement of effect of one agent under the influence of the other one. At the time of pharmaceutical boom that we experience now, these problems require the closest consideration.

Nowadays, man's activities result in an acute negative effect on nature, and sometimes they conceal dangerous and irreversible consequences. Development of chemistry has brought into general use more than half a million substances, and about a thousand of them are able to induce malignancy. Being one of a well understood group of carcinogenic carbohydrates, benzpyrene is found in the air of large cities of Western Europe in concentration of 600 μcg/1000 m^3, it is also found in vegetables, meat, animal fats and vegetable oils. Annually, 5,000 metric tons of benzpyrene are released into the atmosphere the world over, 1,300 metric tons being accounted for the USA alone.

Nitrosoamines have been attracting attention of chemists and cancer specialists for more than a decade. One of them — dymethyl nitrosoamine — was suggested for use as a solvent but it was dropped as it turned out to be a potent carcinogen.

It is believed that industrial and farming products do contain many carcinogenic substances which will let "hear from them" in 10 to 15 years. Lack of understanding is common while speaking of in-

dustrialization and urbanization which moved man away from nature and violated natural interrelations between man and nature.

Mechanism of action of chemical and physical carcinogens is very complex and has not yet been revealed completely. Recently, it has been found that, first, they have an effect on cellular nuclear apparatus and can induce alterations fixing in genome, and, hence atypical and aggressive cellular forms develop. Genetic apparatus is very stable but quantitative overload by evolutionally unexpected pathogenic irritants yields a new quality. Second, carcinogens suppress immunity. This aspect of the problem is deemed extremely important, since immune deficiency closely correlates with neoplasias development.

Experts from International Agency on Investigation of Cancer in Lyons, analyzed interrelations between diesel exhaust effects and malignancies development rate. The gases were found to contain extremely potent carcinogens called nitropyrenes (ARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Lyon, 1989, Vol. 1, p.46). To this must be added that another constituent of the exhaust, namely, carbonmon oxide, possesses an enhanced tropism to hemoglobin and considerably aggravates local hypoxic states including ischemic heart disease.

Environmental pollution does not influence the people only. Of interest is a fact: on a Japanese island there lived a flock of monkeys, the animals got accustomed to humans and took some food from them. Researchers who followed up the animal life on the island made a completely unexpected discovery. Newborn monkeys in wild flocks were found to be more viable and healthy as compared to those born in the flock which allowed people to feed them up. Twelve per cent of the offsprings were born with defects there. After prohibition against animal feeding in the reservation only two of 226 newborns had abnormalities, i.e., inborn abnormality rate was reduced 12-fold. Human beings are the only subjects who pollute the nature and they have more diseases than animals do.

Since its discovery by Wilhelm Konrad Röntgen in 1895, the radiation phenomenon has always been a subject of admiration and of a great concern of humankind. Mass miniature radiography of mam-

mary gland as a mandatory procedure in preventive multiple screenings has been already canceled, for mammary cancer risks are established to enhance after periodical X-ray mammary gland examinations. To decrease radioactive load, specialists try to reduce the number of roentgenoscopic examinations at the expense of roentgenographic ones. Unfortunately, the problem of X-ray film availability has recently become extremely urgent with us and roentgenographic examinations become more frequent as they have been before. Many consumer goods such as microwave ovens and other electric heating appliances have become a growing public concern because they are radiation sources. Radioactive component of environmental pollution has attracted a special attention after catastrophe at Chernobyl Nuclear Plant.

An essential point in pathogenesis of radiation damage is ionization of large molecules of DNA which are the carriers of genetic code. One of serious consequences of radiation damage is cellular malignization. In spite of partial compensation of damaged cells it is obvious that probability of mutational alterations in this kind of situation remains high. There has not been determined yet the threshold radiation dose below which genome damage is equal to zero. Risks of hereditary affection in humans in case of radiation exposure have not been estimated either, though recent investigations in the field of Quantum Medicine enable one to take a new view on the problem ("Changes in the Chromatin Conformational State as Indicator of Leukocyte Response to Low-Dose Radiation" I.Ya. Belyaev, Ye.D. Alipov, D.I. Yedneral. Report at the 24th Annual Meeting of the European Society for Radiation Biology. Oct. 4-8, 1992, Erfurt, Germany, Abstracts, 162 p.). Whereas a latent period (i.e., initiation and promotion) of cancer is very long, a real danger of its development in young humans is retained for 10 to 30 years since the exposure (Lindell B., 1987).

Intensification of social processes, steady development of industry and agriculture resulted in that virtually everybody is prone to stress in its diversified manifestations. The aforesaid may be a factor in the development of both behavioral dysfunctions and bodily disorders. As regards severe mental diseases, at present they account for no

less than 40 million cases throughout the world and at least for doubled number of cases of mental retardation (Sartorius N., 1986).

In our opinion, a qualitatively new approach to practical prevention of most common diseases is of a crucial importance for national well-being. It is closely connected not only with medical science, but also with national economy and legislation. Prevention of diseases is a problem to be solved by those who are responsible for well-being of a society.

Several years before the disintegration of the USSR according to a decree of the Ministry of Public Health of the USSR, prevention departments were setup at policlinics. It should be pointed out, that up to now they have failed to find substantiated forms of their work. One of the reasons is that prevention is to be carried out with the provision of adequate infrastructure. This is an involved question which requires a comprehensive understanding of constituents of present conceptual line in health service.

Now, in Ukraine and particularly in Armenia it is not the best time for provision of preventive service with advanced technologies as a consequence of lack of financial backing and as an aftermath of disorganization processes which involved all domains of human activity. But hard times are transient and the practice of residual financing will be discontinued and an adequate investments policy will be carried out. V.A. Piskunov (1991) believes that transition is necessary from the established practice of bringing patients back to their previous state as a result of treatment to a principally new system of health preservation in practically healthy subjects. As this takes place, scientifically and technically validated mass health improve programs will be growing in importance.

While speaking of cardiovascular diseases which are the most common causes of invalidism and mortality, Yu.L. Kurako and N.D. Gertsev (1991) showed that existing system of measures to prevent acute cerebral circulation disorder and advanced atherosclerosis and hypertension is far from being perfect. One of the reasons is the well established fact that atherosclerosis develops ten and even more years before it manifests itself clinically. Our preventive measures are far

from perfection with reference to the second in importance cause of death, i.e., malignancies. Quite a number of distinguished oncologists virtually do not imagine how to actively prevent this grave disease. In a book with an intriguing tittle "Dossier of cancer" George Mathe (1983), a scholar, Director of Institute of Oncology and Immunological Genetics, points out that physicians will be able to cure three fourth of patients with cancer before they reduce morbidity rate for one third while using preventive measures.

Prevention can be hardly imagined without forming a healthy way of life. E.D. Kovalenko and N.N. Gurovsky (1980) have shown at molecular and subcellular levels the development of structural and functional disorders leading to alterations in organism response as a result of hypokinesia. Hypokinesia itself results in attenuation of various systems of an organism and the latter driven to the verge of premorbid condition development. The authors speak of characteristic blood calcium concentration increase which like hypercholesterolemia and β-lipoproteinemia elevates blood coagulability. Besides, the hypokinesia suppresses defensive immune processes. Motor activity normalizes hundreds of metabolic processes, whence the importance of struggle against hypokinesia follows which is an integral part of modern life.

We have considered the above factors promoting health in detail for the reason that scientists brought out clearly that maintenance of healthy way of life 5.3 times increases probability of remaining healthy further. This task is far from being simple. Thus, as regards tobacco smoking habit, D. Eieghorn is somewhat pessimistic about it: "If causes of the diseases including cancer are well-known, I doubt whether we will feel like paying the price necessary to eradicate the causes."

At present, chemoprophylaxis of some infections and malignant diseases is used for practically healthy people. Obviously, for this purpose natural substances are most suitable, they are vitamins, biologically active substances which posses adaptogene, stimulating antiinflammatory, homeostatic or other properties; microelements, etc. For the last decade, vitamin A deficiency has become the cause of blind-

ness in 2.5 mln of children. Besides, about 10 mln of adults and children show one or another evidence of this vitamin deficiency which may result in attenuation of resistance not only to infections but to carcinogens exposure. Hence a necessity arises in creation of global system of A vitamin supply to population and efficacy assessment. WHO has initiated research to create vitamin A preparation which will be slowly cleared from the body.

New data on iodine excretion with urine in adults, adolescents and newborn, as well as iodine content in breast milk bear witness of widely spread iodine deficiency in European population. The aforesaid deficiency causes mental retardation, hearing loss and other neuralgic disorders (Hetzel B.S., 1987). It has been established that in many countries where only common salt is iodized, iodine content in humans is rather low. Its availability to organisms of fetuses, newborn and children is of primary importance.

It is known, for example, that in many countries threatening levels of measles infection are preserved. This highly contagious disease is dangerous, for it can lead to necrotic bronchitis, which decades later can result in bronchiectasis complicated with amyloidosis and renal insufficiency. Newborns are protected against measles with maternal antibodies. However, in connection with practically world-wide reduction of laclational period, this defense is rapidly lost and children can develop the disease at the age of 5 to 6 months.

Natural substances are primarily associated with biologically active substances, the range of which is rather wide, these are: hormones, enzymes, nucleotides, etc. There is also a large group of chemically unidentified substances. It embraces organospecific mitosis inhibitors, called keilons. Investigations carried out in Oncologic Scientific Center of Armenian Ministry for Health (OSC AMH) have shown that mammary, pancreatic and hepatic keilons produce a pronounced antineoplastic effect in cancer of mammary gland, pancreas, and liver (L.N. Mkrtchian, S.G. Shukurian, 1991).

Treatment with natural substances, especially with mix preparations has roots stretching back into antiquity. It has been recently reported that in China a new medicine against AIDS called millivan

was made which allows the reduction of patients mortality (it constitutes 50 to 60 per cent in Western countries) to 12 per cent, and Denmark was supplied with the aforementioned medicine for 260 million US dollars (Yezhened. Vestnik Instrannoy Informatii "Atlas", 1990, No. 30 (1928), p.79).

In recent years the notion of "quality of life" has received acceptance in medical investigations. The point is that the aim of the therapy is not only to mitigate symptoms or arrest disease progression, but also to regain the sensation of physical, mental and social well-being (T.F. Zakharova et al., 1991). It is known, for instance, that majority of women, who underwent mammary excision, experience extreme unsatisfaction. The operation often provokes postectomic depression up to loss of self-esteem. Physical activity falls noticeably in the patients operated on the heart. Medical intervention often alterates quality of life and its comfort. Because of this, under the conditions of permanently increasing volume of medical services, population's satisfaction estimate far is being placed higher and higher. V.K. Ovcharov et al. (1991) analyzed the results of Moscow residents inquiry held in 1988 using questionnaires developed by WHO Regional Office for Europe and fitted to meet local conditions. Similar sociological inquiries were conducted in Greece, Yugoslavia and Great Britain. When appreciating quality of medical care, the population was found to move forward those professional and personal qualities of a local physician or a dentist as well as character of interrelations between a physician and a patient. There were emphasized even such details as that a doctor should not be in a hurry, then there followed doctor's attention to the patient, and completeness of medical advice on the way of life. Confidence rendered by a patient to a physician is an essential condition of correct interrelations. Many specialists do not so much examine patients but rather study results of various tests and trials. These are complex ethical problems which are impossible to be solved by taking up calls for normal relations between a physician and a patient.

Medical approach in respect of persistence in life maintenance is being widely discussed, i.e., whether to sustain it to the torturous end.

Both physicians and psychologists do not believe the maintenance to be justified and rational. The case in point is not children with infantile cerebral paralysis, Down disease, etc., but fatally diseased subjects who have the right to leave the life with dignity. In actual life it can mean abandonment of such interventions as hyperventillations, drug therapy, surgery, and even parenteral feeding and rehydratation (Roy D., 1989). The problems are complex and ticklish and do not exclude therapeutic errors, so to say, conscientious fallacies of physicians.

The source of a growing concern of health professionals and governments has become an impetuous spread of alcohol and drug addiction which is very hazardous and reduce social and economical efficiency of individuals and even the whole nations. In a number of developed countries due to alcohol abuse, liver cirrhosis has become one of five major mortality causes in subjects aged 25 to 64, and besides, it is a cause of up to 50 per cent of cases of death in traffic accidents (Holtzman W.H. et al., 1987).

As new factors are revealed which influence health, in future medicine men will have to formulate appropriate indicators, namely, nutrition adequacy, physical and mental functions, social adaptation, population participation in undertakings on health and environmental protection (Uemura K., 1988). It is evident that in the course of time, using improved technologies wide social economical undertakings and by means of propagation of healthy way of life, humankind will manage to prevent major severe diseases. This is the strategy of WHO which declared achievement of health for all by the year 2,000. A tidious analysis is wanted of both qualitative estimates of global programs results and of major obstacles to the movement in the envisaged direction.

For objective importance of facts despite the attractive achievements, many medical problems are far from their decision. The growth of diseases' either infectious or uninfectious nature number became the tragic phenomenon, and the struggle against it may last for more than one decade. In our opinion, some socioeconomical factors in Health Protection put the strategy of health for all achievement

to 2,000 on the edge of destruction in connection with discrepancy between the reality and social ideal (besides, this is authorized not only for the independent republics that composed the former USSR, but also for developing countries), what is steadily manifesting by unsatisfactory function of health protection against the widest spectrum of diseases (Piskunov V.A., 1991).

While summering mentioned above it must be concluded that the modern medicine in spite of generally accepted achievements in the most important viable directions is at the limit of its possibilities. In a number of cases, unnatural approach of official medicine also calls attention, for while failing to cure simple diseases, it generates more serious conditions in many cases. The way out is to be sought either in reverting to nonconventional "folk" methods of treatment or in developing the new medicine based on fundamental understanding of living matter nature.

In the years of totalitarism in our country natural hygiene, other time-honored approaches to treatment, and medical astrology were buried in complete oblivion. Incidentally it should be mentioned that in many other countries there has been achieved some success in unconventional medicine. Put forth by Herbert Shelton principles of natural hygiene have gained much recognition. A new and a deeper sense has been put into postulate of the ancients: physicians apply remedies but the nature heals. Naturopathic approaches, i.e., approaches based on healing with nature have saved a great number of lives. Even at the end of the 19th century, when the age of microbiology came, a lot of medical men did not discard natural methods of therapy. Honor of therapeutic school of Moscow University Grigory A. Zakhariyn who subjugated the world with his genius, patience and concentration in exploring a patient's way of life and with great success in therapy early treated fever up to 39-40 °C in patients with acute diseases. He adduced an argument that fever is self-defense of an organism. Modern clinicians, pathologists and microbiologists consider the wide uncontrolled, or rather unscrupulous, use of antibiotics to be one of the major causes of increase in a number of patients with chronic nonspecific pulmonary diseases as well as with

other numerous chronic inflammatory conditions which are due to uncompleted acute inflammation.

However, the methods which are unconventional and alternative to officially acknowledged medicine should not be identified with sorcery. M.B. Blokhin (1977) mentions, that while at Oncological Center, he had time and again to consider questions relating to nonscientific methods of treatment and sorcery in oncology, the former being sometimes supported by general newspapers, against the opinions of specialists in cancer. Some "inventors" were very skillful in advertising their so-called "methods of therapy." By and large, representatives of unscientific doctoring try to envelop their "methods" in mystery and tend to create an atmosphere of extreme importance. For the most part, as M.B. Blokhin says, these are ignorant people who believe it possible to make discoveries in medicine without special education and scientific background.

In recent decades acupuncture has become usual owing to its pronounced regulating and adaptogenic effect, relatively simple operation with, and harmlessness, as well as the possibility of use on an outpatient basis (Stux G., Pomeranz B., 1987). It is used for anesthesia, myorelaxation, desensibilization, to produce sedative and anapyretic effects, if is aimed in correction of homeostatic system disorders (V.I. Shapkin et al., 1987).

Thus, in spite of multifarious and rapid development of up-to-date methods of therapy there has appeared an acute necessity in development of a new fundamental medicine providing with optimal ways of human health restoration and maintenance. When medicine comprehensively embraces achievements of seemingly incompatible Eastern and Western medicine, conventional and nonconventional treatments, it is apparent that this medicine should lean upon only on untangling fundamental laws of the living matter, knowledge of these will transform biology into fundamental science able to move forward on the agenda the problem of gene code retranslation through the great insight into mechanisms of tissue differentiation and shape forming.

Predominantly therapeutic orientation of public health has not reduced the stream of outpatient and inpatient subjects. Further still, cohort of patient with severe incurable diseases has even increased. A strong trend toward growth of common diseases has been noticed not only on the territories of independent republics which were joined in the Soviet Union, but in developing countries as well as in developed ones. Hence it follows that strategy of public health is to be reviewed with its successive step-by-step reorientation to prevention.

Chapter 3

Achievements and Perspectives of Quantum Medicine in Treatment of Some Somatic and Psychoneurologic Diseases

20 years have elapsed since publication of the first articles on the effect of the mm-range low intensity electromagnetic fields on different biological systems. Over this period, interest to EMR EHF has being constantly increased and above all in the context of quantum physics. The problem is beyond the applied medical vision and a large body of researches transformed it into the process of investigation of general biological regularities of functioning and stability of the living matter.

In the following paragraphs, we will consider the mechanisms of recovery and maintaining of stability of functioning and structural organization of a human organism by MRT with a variety of pathological conditions.

GASTRIC AND DUODENAL ULCER

Gastric and duodenal ulcer is a chronic disease with a cyclic course, the clinicomorphological manifestation of which is a relapsing ulcerous defect. The basis for this disease is disturbance of the nervous and humoral mechanisms controlling the secretor and trophic processes in a gastroduodenal zone, resulting in changes in a system of the aggression and protection factors. Hereditary and constitutional factors play a part in the peptic ulcer development. Abnormal viscerovis-

ceral impulses, disturbances of the hypophysical and hypothalamic system activity disorder in a gastrin, secretin, enterogastrone secretion are of pathogenetic importance. These circumstances are worthy particular notice in the context of motivation of general and special approaches to treatment for this wide-spread disease. From the pathogenetic standpoint a general action upon a patient's organism in an effort to correct multiple disorders of ulcerous process is of priority. MRT as a radical departure from conventional practice of recovery of the integral human organism functional activity meets these requirements.

According to technical parameters of EMR EHF sources in use (B.P. Grubnik et al., 1992) there are the following therapeutic modes:

1. With individual resonance frequency selection (generators G4-142, P2-69, "Aria", AMRT);
2. "White noise" mode ("Porog", AMRT);
3. Sweeping mode (P2-69, "Aria").

MRT of ulcer differs from drug treatment by more pronounced therapeutic effect which is seen as follows:

– general state improvement and pains alleviation are often observed even after 1 session;

– elimination of the dyspeptic symptoms and arresting of the pain take place in 90% of cases after 6 sessions on the average;

– complete ulcer healing is observed in 80-85% of patients; it is proved by endoscopy in 10-12 days since the first MRT session.

Of special note is that after MRT peptic ulcer relapses occur 3-4 times less frequent than after treatment by traditional methods.

Correction of the humoral disorders in multicomponent pathogenesis of peptic ulcer is growing a prime consideration in its treatment. T.A. Zhukova, A.A. Yakovlev (1989) have found a very interesting fact of a decrease of the enhanced (before treatment) level of the gastrointestinal hormones (gastrin, calcitomin) and an increase of the reduced secretin concentration after MRT. The changes of similar nature were also ascertained for the system of neuropeptides.

With peptic ulcer, the metabolic processes initial state is characterized by the reduced ATP content, lowered energetic processes level, reduced content of high density lipoproteins and vice versa by the ADP and AMP increase, elevated content of pyruvate, lactate, oxalacetates, low-density lipoproteins, triglycerides. The data by L.V. Mukhina (1989) concerning the mentioned above changes under the MRT effect uniquely testify to its promoting effect on the metabolic processes. Moreover, mobilization directed toward the maintenance of necessary equilibrium of the metabolic and energetic processes takes place in other systems of the organism. Normalization of the immune status, the immunoglobulin procession in particular, occupies a significant place in the curative effect mechanism of Quantum Medicine (N.V. Postovit, 1989).

Clinical observations (V.M. Kuz'menko et al., 1989) revealed that MRT noticeably accelerates the mucous stomach membrane epithelization after endoscopic electroexcision of single or multiple stomach polyps. Moreover, pain syndrome arrest takes place more rapidly, postelectroexcisinal inflammatory infiltration is decreased and the stomach motility is improved with MRT.

Gastric ulcer, polyps and especially stomach carcinoma are not uncommon against a background of gastritis. Chronic gastritis, both in hyperacid and anacid cases, is characterized by combination of the alternative, oxidative and proliferative processes. The basis of them are long-term dystrophic and necrobiotic changes of the mucous membrane epithelium the result of which is the structural changes in the glandular and connective tissues. Chronic gastritis constitutes 80-85% of the stomach pathology. Patients with atrophic — dysregenerative changes should be carefully followed up after treatment and should be investigated no less than twice a year (F.J. Komarov, A.L. Grebnev, 1983). But in reality it does not take place. Therefore such an extremely common disease as chronic gastritis does not come into the view of the physicians, specializing in MRT. Still it should be mentioned that observations of the patients suffering from chronic gastritis with frequent exacerbations suggest that rational nutrition, limited consumption of alcoholic drinks, cigarettes and drugs

(exerting stimulating action on the mucous membrane) cessation, elimination of the exo- and endogenous intoxications and other well-known methods of treatment for this disease, may be useful to combine with MRT. This makes it possible to reduce a high incidence of exacerbation repetitiveness.

ACEPTIC NECROSIS OF THE FEMORAL HEAD (PERTHES' DISEASE)

The basis for aceptic necrosis of the femoral head are circulatory disturbances. Conceptually it is discirculatory necrosis — the result of trauma, endocrine and metabolic disturbances in the osteo-articular apparatus. This disease is more frequent in boys aged 6 to 10, it accounts for 1 to 3% of general number of the locomotor system diseases in children (M.B. Volkov, O.L. Nechvoldova, 1982). The basic method of treatment is conservative, the foundation of which is the affected extremity unloading in an effort of prevention of the degenerating femoral head deformation.

Quantum Medicine has opened up the new opportunities in treatment for these diseases. The well-known Ukrainian orthopedist-traumatologist, now-late professor I.I. Tal'ko has made a significant contribution to the development of the procedure with the use of microwaves for treatment of the femoral head aceptic necrosis.

MRT as a method of treatment of aceptic necrosis of the femoral head permits not only to accelerate the necrotic detritus resoption but also to normalize the formation processes in the femoral head region through capillary hyperplasia stimulation and osteoblasts division promotion. E.V. Binyashevsky has demonstrated brilliantly made macropreparations documenting almost complete recovery of the femoral head configuration in experimental animals. It is reasonable to suppose that the matter is not only in "mechanical" acceleration of the microcirculatory and regenerative processes in a bone tissue but in the recovery process outside the degenerated and decreased femoral head. To put it differently, the microwave effect upon BAPs is not limited by local changes but it assumes a generalized character and

propagates outside shortened neck of the femur and the impressed femoral head. MRT aids in normalization of the shaping processes which are evolutionary consolidated. It is quite new, and integral approach to the problem of treatment for aceptic necrosis of the femoral head. It substantiates the conceptual fundamentals of Quantum Medicine.

It is pertinent to know that the aforesaid is also true for cotyloid cavity, the roof of which may be truncated with this pathology. Conceptually, the main reason of the femoral upward and outside sublaxation is the femur roof beveling as a result of deforming arthrosis of the cotyloid cavity region. The prevailing reparative processes in the roof witness rather of a selective osteo-osseous tissue formation directed to normalize shaping process than of diffuse osteosynthesis. The aforesaid is in the context of a homeostatic conception of MRT which without regard to the nature of the pathologic process causes the shifts in an organism, directed to the recovery of the structure formations and disturbed functions.

Studying the specific biochemical changes in a connective tissue following Perthes' disease, T.N. Perfilova et al. (1989) have come to the conclusion that in children under MRT effect the level of collagenolytic enzymes and elastase is decreased and proteinosis activity is normalized, especially with acute cases. Therefore the regenerative processes prevail over the processes of the tissue degeneration. In the second stage of the disease (an active course) the elastase-antielastase and protease inhibitors ratio is completely normalized after 3-4 courses but with inactive course it does not take place even after 5 courses. This point is of special note as the effects of MRT are the most evident with the heavy and progressing processes.

It is well known that catecholamines are functioning as regulators in a sympathicoadrenal system. Adrenaline increases the activity of phosphorylases providing mobilization of the carbohydrate resources, stimulates a cerebral cortex and noradrenaline performs the homeostatic function. I.I. Tal'ko, T.I. Tkachenko et al. (1989) found that if before treatment the noradrenaline-adrenaline ratio was re-

duced to 0.8, so after 10 to 15 sessions of MRT this ratio was increased by 1.8 to 2.6 times.

With the conventional methods of treatment for aceptic necrosis of the femoral head complete recovery with restoration of a normal spherical head of the femur is observed in 20-25% of the patients. In spite of the significant clinical experience we do not cite the figures of full healing of Perthes' disease by MRT (we have received excellent and good results in most of the children). It can be only said with confidence that MRT noticeably accelerates the bone tissue reparation and thereby reduces the treatment time by half. Rather important is the fact that, in comparison with the drug and physiotherapeutic treatment, MRT is more economically attractive and convenient to use (Ye.A. Andreyev et al., 1989).

The circumstantial evidence of normalization of the shaping processes in the bone tissue with quantum therapy impelled us to the special study of regeneration in an experimental model.

It is self-evident that regeneration is a complex, and by no means, investigated process depending first and foremost on a regenerative potential of one or another tissue or organ. (Nobody provides artificial conditions for the "waveguides" extension after a self-amputation of a lizard's tail, nevertheless it grows up completely.)

The regenerative potential of epiderm, intestine mucous membrane, medullar tissue, liver is extremely high both in mammals and in a man. To gain a better understanding, let us consider the following example. The liver in rats has been resected 12 times within a year. A total of 71 g of the liver tissue has been resected with a weight of a whole liver averaging 17 g. And each time quick and complete recovery has taken place. It is well known however, that other organs are not able to restore their shape, say young frogs' paws almost do not regenerate after amputation. It is our opinion (Prof. S.P. Sit'ko) that one of the reasons preventing the extremity recovery is interruption of the coherent waves propagation along the corresponding meridian. The investigation amounted to the following: if to make liquid medium having the corresponding optic characteristics around the ampu-

tated extremity (to prevent the wave process interruption at the amputation boundary), so the extremity is bound to grow better.

3 groups of young frogs (ten in each group) were used. In the experimental and control groups the forelegs were amputated below the elbow joint, the third group were used as blood donors. Collected blood was pored into rubber tips of ordinary droppers with an addition of one drop of the heparin solution (20,000 U.) to prevent blood coagulation. The paws were dried up. The rubber tips with heparinized blood were forced on the amputated forelegs of the experimental group frogs and fixed on them with a special adhesive plaster. In the control group only amputation of the forelegs was made at the same level as in the experimental group. The performance of the experiment met some technical difficulties as from time to time the tips slid off in about 30% of the frogs, this brought up to necessity of the tips replacement.

In connection with the technical difficulties mentioned above observations lasted for 8 days only. By this time 2 frogs perished in the experimental group, and 3 — in the control one. On completion of the experiment all forelegs were amputated above the elbow joint, examined under the microscope and photographed both in the experimental and the control groups.

In none of the cases complete recovery of the pre-existing paws configuration occurred. In the control group, regeneration of both the bone structure and cutaneous integument markedly lagged behind the experimental group. A bone with a rounded edge covered with a mucilage-like mass extended above an incision surface. In the experimental group, slightly flattened exostosis was found with fairly better crawling of the epiderm against the resected bone and soft tissues.

Under the microscope, an intensive growth of the connective structures of periosteum, endosteum and perivascular tissue engaged our attention. Against a background of reparative regeneration of the connective structures, local hemorrhages and dystrophic (degenerated) myeloid elements were observed. In the control group, infiltration with neutrophilic leukocytes and necrotic detritus were more pronounced than in the experimental one.

Relative perfection of the bone tissue regeneration in animals with the rubber tips containing blood as the most suitable internal medium of an organism manifested itself in more noticeable homogenization of a fibrillar matter it is known to be a consequence of the ossein fall-out. Bricked up in bone matter the extended cells partly covered shaping booms. A number of dividing osteoblasts was 3-4 times more in comparison with that of the control group. Large multinuclear cells like osteoclasts occurred as unit specimens both in the experimental and control groups. Proliferative processes in an epithelium and in derma particularly, in the animals of experimental group were more prominent. Thus, provision the adequate conditions for the microwave propagation outside the amputated part of the frogs' forelegs promotes intensification of the reparative processes. Purely technical difficulties gave no way to continue the experiment and thereby to follow the course of the regenerative process in more recent times. However, on evidence of the facts, we can make the inference about acceleration of the recovery processes in the bone and dermal structures in animals of experimental group.

Considering the results obtained the idea may come to mind that blood washing a stump and being a good nutrient medium is apt to intensity regenerative processes by itself. In this connection it should be kept in mind that tissue decay products (necrohormones, trephines) are by far a trophic factor for proliferating cells. Moreover, according to A.M. Gurvich, a stimulating action of the decayed products is manifested by its ability to radiate ultrashort waves possessing mitogenetic properties. In the definition of problems it is apparent that we have to do not with whole blood, but with products of interstitial decay in the stump and especially with leukocytes which were far in excess in the control group. Therefore, an explanation of better regeneration of a leg due to mm-wave application we consider to be more valid.

In conclusion of this paragraph we would like to dwell upon economical efficiency of Quantum Medicine in treatment for aseptic necrosis of the femoral head. The calculations by Ye.A. Andreyev et al. (1989) have shown that treatment of one patient by a traditional method costs 6221 rubles (prices of 1988) but by the Quantum Medi-

cine — 1073 rubles. Use of MRT in a group of 50 patients made it possible to save 257.4 thousand rubles what was a substantial financial justification of Quantum Medicine advantages.

INFANTILE CEREBRAL PARALYSIS

It was not so long before that infantile cerebral paralysis was considered to be mainly caused by intrauterine hypoxia, perinatal asphyxia, birth trauma, and cerebral hemorrhage. In recent decades it is becoming more clear that important are intrauterine neuroinfections which lead to listerosis, colibacillary, staphylococcus, influenza and other encephalites and meningoencephalites (K.A. Semionova, M.I. Antropova, 1977). After in utero initiation, the process is going on for years as flabby meningoencephalitis an infections or neuroallergic origin.

Clinical and experimental investigations provide for conclusions that intrauterine encephalitis can be caused by autoimmune processes as well. K.A. Semionova and M.I. Antropova think that chronic intrauterine hypoxia disturbs metabolic processes of a fetus vascular system of its brain, which is being formed that results in an abnormal delivery leading to perinatal asphyxia and birth craniocerebral trauma. This is a very interesting idea though hypothetical to some extent. On our part, it is to be noted that both the fetus and the mother are subject to autoimmunization as a result of changes in the placental barrier. That is why the study of pathological autoimmune processes at various stages of embryogenesis is of a paramount practical and scientific importance.

In ICP, motility development is most often stopped at the stage where tonic reflexes dominate. Therefore, in severe cases, at the age of 1.3 to 5.0 years or even more, his or her motor skills may remain at the level of development of a healthy infant aged 2 to 5 months. Under the prolonged effect of early tonic reflexes, there are created unfavorable conditions for development of coordinated activity of other analyzing systems (vision, vestibule apparatus, skin sensibility, deep sensibility, etc.), what hampers normal positioning and movements, in-

hibits formation of spatial notions and orientation. Disorders of motor analyzer and of other analyzing systems make normal adaptation to the surroundings difficult. This is closely related both to characteristic organic nervous system involvement, features of character and conditions for patient's development and education. Since birth, the diseased child is unaware of his (her) abilities because of limited experience gained which is due to motility disorders that close the circle of patient's ideas and notions. Consequently, it is very important to unveil and develop patient's potential abilities which will contribute to his (her) self-confidence and positively influence results of rehabilitation treatment.

Combined ICP treatment includes MRT, medication, physical exercises, orthopedic assistance, massage, physiotherapy, training by speech specialist and psychologist, acquisition of self-assistance habits, and habits of work.

There are no radical therapeutic approaches to the disorders in the conventional medical practice. Invalidism that exhausts both children and parents is very high. Hence it makes the urgency of searching for new methods of prevention and treatment more understandable.

With the aim of proving the effect of MRT I.I. Tal'ko et al. (1989) carried out an electroencephalographic investigation of 35 patients with paralysis aged 5 to 15. Prior to treatment there were registered various deviations in electrical activity of the brain having the signs of irritation acute potentials and grouped low theta-waves at frontal portions as well as instability of alpha activity at occipital portions. About 50% of the patients, after the millimeter wave treatment showed no substantial positive changes in an electrical activity of the brain. The rest of the patients displayed an improvement in electroencephalographic characteristics, mainly in the case of a hyperkinetic form of disease. I.I. Tal'ko et al. (1989) note more prominent positive dynamics in the clinical picture in children with light and medium complexity involvement while patients with the serious involvement demonstrate a lower clinical effect. This is a rather unusual situation

since different experts of "Vidhuk" observed the more distinctive sanative effects of MRT the more serious was the case.

Changes in the immune system of palsied children are also of interest. The investigations carried out by N.I. Lisyany et al. (1989) showed positive changes in the amount of T and B lymphocytes and the level of anticerebral antibodies (in the sense of a decrease in their number).

One of the main characteristics of a homeostasis is a balance of hydroxyperoxidation processes in an organism. After 10 sessions of MRT all the patients displayed an improvement in lipid hydroperoxidation and, in particular, reduction of spontaneous chemiluminescence of blood serum by 50 to 51% and of malonic dialdehyde by two times (D.C. Sutskoy et al., 1989).

Main syndromes of cerebral palsy which prevent restoration of motor functions are known to include dyskinesia, muscular hypertonisity, and an impairment of motor movement. V.S. Shargorodsky et al. (1989) convincingly demonstrated that after the first session of treatment the neuromuscular system dets improved (though for a short period), coordination of movements, i.e., a decrease in amplitude of oscillations of the flexor tonicity by 29% and that of leg extensor tonicity by 27% compared with the initial state is partially lost after a month-long break between sessions.

On the whole, clinical and laboratory data analysis allows therapy by EHF electromagnetic radiation to be considered a highly effective method of cerebral palsy treatment in children without negative side effects, there is a considerable clinical effect that does not require medicamentous support.

CARDIOVASCULAR PATHOLOGY

In economically developed countries every second subject dies of cardiovascular problems. Ischemic heart disease (IHD) occupies the first place in structure of morbidity and mortality. It includes a group of diseases and morbid states, the main causal agent of which is atherosclerotic coronary arteries involvement. Investigations carried out at

a representative cohort showed that in cases of IHD, risk factors are age, male sex, enhanced blood serum lipids levels, arterial hypertension, tobacco smoking, diabetes mellitus, lowered physical activity, personal behavioral peculiarities and some others (V.S. Gasylin, V.A. Bogoslovsky). The aforementioned ethiopathogenetic factors are listed here in detail in order one could better imagine the role of MRT in struggle against this disease.

It is a common knowledge that pronounced coronary arteries sclerosis up to a complete closure of arteries may proceed without any clinical manifestations. Discrepancy between the degree of coronary arteries atherosclerotic involvement and severity of IHD speaks of importance of additional conditions and specific features of atherosclerotic process. The above needs to be explained in order to clearly imagine the place of Quantum Medicine therapy in IHD treatment. While getting ahead of the story, it is worth to note that application of Quantum Medicine does not result in atherosclerotic plaques resorbtion. The atherosclerotic process is irreversible, except, probably, extremely rare cases, and it takes place at the stages of lipoidosis and liposclerosis, and never at stages of atheromatous ulceration and calcifications. MRT produces coronarolythic effect only, which is of temporal character. Therefore, when in struggle against IHD the problem of MRT application is put forward we should predominantly stress the preventive aspect, for MRT has a property to maintain in equilibrium blood coagulation and anticoagulation and exerts a limiting effect on metabolic and trophic processes which are beyond the physiological alterations. This is the approach which can reduce fatal inevitability of IHD, which is to be discussed in Chapter 4.

Since 1990, at A.I. Meshchaninov Kharkov Emergency Hospital, researchers from Ukrainian Institute of Advanced Medical Studies in collaboration with specialist of myocardial infarction department of the aforementioned hospital have initiated research investigations of IHD treatment with MRT. In the treatment, there are used generators of coherent oscillations and those of "white noise" with the frequency band 50 to 70 GHz. L.P. Khimenko and A.N. Nudha (1992) regard a sensory response in a form of warmth sensation in the region of the

heart comfort and drowsiness as a positive prognostic sign. Of interest is that when the patients reported to feel themselves better, the improvement is supported by objective indices (pulse rate, arterial pressure, cardiac and stroke output, contractile myocardial energy consumption) after 2 to 5 MRT sessions. This enables specialists in cardiology and MRT to reduce doses of medicinal agents for the patients up to their complete withdrawal.

Of a special interest is the treatment of unstable angina pectoris which is the most common coronary circulation disorder. Development of unstable angina is due to angiospasm which occurs in moderately atherosclerotic coronary arteries. We emphasize here a moderate character of sclerosis for the reason that in advanced cases, spastic constituent grows weaker due to smooth muscles atrophy and vascular wall tissue with is replaced fibrotic one.

Not long ago anginal manifestations were believed to be exclusively connected with organic involvement of coronary arteries. But at present the concept of angina pectoris genesis has somewhat changed: it is not exclusively atherosclerosis or spasm which is emphasized, but both. As usual, the truth was somewhere halfway between. It has turned out that spasm of terminal length of arterial network of myocardium results in intima rupture and this promotes thrombi formation, and thromboembolism which irritates baroceptors of arterial vessels intima initiates spasm. Thus, pathogenesis of angina pectoris in general, and of unstable angina, in particular, should be regarded from the point of view of functional and organic involvement, i.e., neither spasm no thrombosis but both of them in organic unity of causative-sequential relationships. This is the position from which we should consider mechanism of MRT effect on coronary circulation. MRT cannot influence the degree of organic atherosclerotic involvement of coronary vessels, it can only:

a) exert an acute vasodilating effect and improve collateral circulation;

b) enhance initially reduced fibrinolithic blood activity and dissolve parietal and obtrusive thrombi (of atrioventricular knee and larger arteries);

c) via normalizing effect on central neurovegetative mechanisms to prolong vasodilating effect and to balance metabolism and trophic processes in contractile myocardium.

A.B. Ostrovsky et al. (1989) obtained some data that in patients with focal myocardial infarction MRT did not exert normalizing effect on metabolism in myocardium of hypoemic genesis. We cannot accept their point of view without reservation, for it was based on the fact that there remained alterations of T-wave which suited to characteristic dynamics of infection signs in subacute phase (deepening of T-wave or inversion reduction by the end of the phase). Along with this it should be mentioned that in 10 of 12 patients with myocardial dystrophy of metabolic character after 10 days course of MRT, A.B. Ostrovsky et al. (1989) noted a discrete improvement in ECG in end part of ventricular complex, which attests to normalization of the repolarization phase. Of importance is the conclusion drawn by the authors that positive changes in ECG recordings in all without exception cases of myocardial dystrophy of metabolic character were accompanied with complete pain alleviation and vegetative dystony attenuation.

MRT arrests acute pain and breathing becomes free, patients experience comfort and drowsiness. Usually, no more than 10 MRT sessions are necessary. It has been established that both circulation improves and myocardial contraction function normalizes. These are the two factors that give reasons to recommend MRT as an extremely important pathogenetic component of patients with acute and chronic IHD treatment.

L.P. Khimenko et al. (1992) noted an extremely interesting phenomenon in the treatment of unstable angina pectoris. MRT was found to enhance five fold the efficacy of medicinal agents. Hence, two important conclusions can be drawn. First, against the background of MRT it is possible to sharply reduce administration of antihypertensive drugs, and the second, MRT should not be contrasted with conventional drug therapy of IHD. The future may well lie with optimal combined treatment regimen of this severe disease, with search for modalities to potentate the effect of drugs in minimal doses.

Ischemic and hemorrhage apoplexy is second to IHD as regards vascular diseases incidence rate. Ischemic apoplexy can be tromboembolic or hemorrhage. In both cases brain tissue which is so sensitive to oxygen deficiency becomes ischemic and dies. This is true for the nervous cells themselves and also neuralgia since a derivative cell of connective tissue has a high regenerative potential and is resistant to oxygen deficiency. It should be mentioned that clinical manifestations of hemorrhage and is chemical apoplexies hardly differ. In both cases hemiparesis is a leading sign of the disease. Meanwhile, the therapy should be rigorously differentiated. In hemorrhage cases first aid should be aimed at stanching bleeding into brain tissue via formation of a clot at a ruptured locus of the artery, and on the contrary, in case of thromboembolia, it is necessary to dissolve the clot as soon as possible in order to recover regional circulation in brain and by doing so to limit area of necrosis.

Analysis of autopsies protocolled for 20 years at the Chair of pathophysiology of Yerevan State Medical Institute has shown that immediately after heparin injection, 23% of patients developed acute aggravation with subsequent fatal outcome. Hence it follows that in the latter cases physicians did not deal with thromboembolic apoplexy, it was the hemorrhage where thrombosis of a ruptured vessel is a defensive measure.

MRT role in treatment apoplexies should be assessed from the standpoint that it does not exert acute thrombolytic or, on the contrary, coagulation effect, but along with it, MRT is deprived of severe side-effects which rather frequently lead to death.

MRT alters brain bioelectrical activity in patients with early forms of cerebral atherosclerosis. M.Ya. Gubarets (1989) studied 96 patients with atherosclerosis of brain vessels using 16 channel neurographer, magnitographer and spectral magnitographer. EEGs of 87 patients after MRT showed positive alterations in bioelectrical brain activity. This, in particular, is seen in enhancement of spectral power of EEG in the band of α-rhythm to 16% as compared to initial values which witnesses of synchronization processes restoration. Besides,

lowering of slow waves spectral power pointed to normalization of a number of brain functions.

Metabolic basis of the above biophysical changes is complex and challenging. Chemiluminescent definition of free radical, oxidation and changes in activity of enzymatic and non-enzymatic antioxidant systems can attribute to their understanding. In this connection, extremely interesting are investigations conducted by Yu.P. Grinevich et al. (1989) who showed peroxidase activity of patients with atherosclerosis and brain vascular dystonia to normalize under EHF EMR effect in the band of 53 to 57 GHz, the power being 1 mW/cm^2 and chemiluminescence curves to depend directly on dynamics of clinical state of patients.

Some clinical experience has been accumulated for treatment of various forms of cerebrovascular diseases with application of EHF EMR generator of "Artsakh" type at R&D BIO attached to Armenian Oncological Scientific Center. Seventeen patients have been followed up for 3 years. 8 patients had arterial hypertension with weak manifestations of angina pectoris or paroxysms during or after MRT course. Especially effective is Quantum Medicine at early stages of brain circulation disorders and when residual signs of ischemic or hemorrhage apoplexy are observed.

V.M. Kuz'menko has gained an experience of MRT treatment of more than 200 patients with cerebrovascular diseases. At the 1st All Union Symposium with International Participation he scrupulously analyzed the clinical investigations and showed that in 77% of patients with initial manifestations of blood circulation disorders and at I to II stages of dyscirculation encephalopathy there were gained positive results. According to long-term follow-up. remission is maintained to 1.5 years. Moderate and unstable therapeutic effect (to 2 months) was noticed in 50% cases with residual signs of apoplexies and atherosclerotic encephalopathy at stage III.

Thus, in acute cerebrovascular disorders, MRT cannot have a claim to be anywhere near leading role. It is rather aimed to arrest one or other pathological symptom at the acute stage of the disease and can be regarded useful at the stage of recovery. In all likelihood, re-

searchers should place emphasis of the quest of optimal combination of conventional urgent drug therapy with Quantum Medicine As for preventive aspect of the problem, with which we shall deal in the next chapter, MRT normalizing blood coagulation potential and abating vegetovascular dystonia can claim for an adequate place in fight against this severe and wide-spread vascular disease.

OBLITERATING THROMBOANGEITIS

It is an inflammatory disease of extremities arteria which is characterized by narrowing of vessels lumen up to its complete obstruction which is accompanied with circulation disorder in the involved extremity. According to the thromboangeitis localization one discriminates among aortoiliac disease, femoropoplietal disease and small vessel disease, each one having peculiarities of its own. The most permanent signs are intermittent claudication, pain under stress and at rest, deficient blood supply and ischemic necroses. Progression of the disease is slow but steadily worsening.

Basic clinical indications for MRT application are pain, edema, gravitational ulcers and necroses. Treatment technique is rather variable and depends on stage and localization of the disease. It is significant that in cases of tropism disturbances in the form of ulcers and necrotic foci, the foci are locally exposed to EMR EHF for 10 to 15 min. To objectively assess the therapeutic results, V.A. Kutsenok et al. (1992) studied the regional and capillary circulation. The data obtained by the authors point to a considerable (more than 4 fold) increased volume of blood flow and to elevated partial oxygen pressure in distal parts of tissues to 37±2.7 mm Hg.

Pathogenetic validation of MRT is supported by correction of metabolic and trophic disturbances, dyshormonal arrest, antiedematous, antiinflammatory and anticoagulation effects.

MALIGNANT NEOPLASIAS

An extensive and various material obtained at many medical institutions, as Armenian Oncological Scientific Center, evidenced that

application of low intensity EMR of millimeter waveband enables one to correct certain immune and metabolic processes in patients with some malignancies. Immunological status is activated, coagulopathy and unbalance of some enzymatic systems are attenuated. The first and foremost apply for INF processing, functional characteristics of monocytes and T-lymphocytes subpopulations.

In patients with primary cervical cancer prior to the treatment we found T-cell deficiency which was seen as a reliable (when compared to healthy subjects) reduction in a number of lymphocytes, and "active" T-cells ratio, also suppression of monocytes adhesion. T-lymphocytes enhance after MRT at the expense of helper cells and suppressor cells, and as a consequence their ratio does not change considerably. If prior to the treatment T-lymphocytes per cent constituted 40±3.1, T-active lymphocytes — 23±2.1, T-helpers — 27.2±1.8 and T-suppressors — 13.1±1.1, after MRT they were reliably enhanced and constituted 47.2±3.4, 28.5±1.8, 31.0±3.6 and 16.0±2.0 per cent, respectively. Monocytes tended distinctly to enhance their adhesive properties — up to 30%. It is interesting to note that in healthy subjects indices of T-lymphocytes and T-monocytes system after MRT did not undergo substantial changes. If before MRT in healthy subjects T-lymphocytes constituted 58±3.6 per cent, T-active lymphocytes 28.5±2.2; T-helper cells constituted 37.5±2.9, T-suppressor cells — 19.5±1.3, after the treatment these values constituted 58.5±3.9, 29.5± 23; 38.5±3.4 and 20.0±1.7 per cent, respectively. Monocytes adhesion did not change at all.

The mentioned above gives grounds to believe that MRT exerts immune promotion effect in cases of immune system suppression, with no effect in normal immunity. It is of interest that in healthy subjects who had T-lymphocytes and their "active" fraction below of norm, a complete restoration of these indexes occurred after MRT course.

Similar data were obtained on INF status. In healthy subject, peripheral blood mononuclears ability for INFγ production equaled 120 U/ml; INFγ was not found in blood serum. MRT did not influence

these indices. Meanwhile, in patients with cervical cancer who had a significantly depressed INF status, especially at stages II and III of the disease, after the treatment enhanced INFγ synthesis was seen. An average titre 20 to 40 U/ml elevated to 95 U/ml. As a rule, a complete INFγ production normalization took place at first stage of the disease. Thus, an immune correcting effect of MRT was found in regard to one of important indices of INF status which was expressed as restoration of ability to produce immune INF in patients with malignancies.

Most cancer patients who receive chemotherapy with application of antracycline group preparations, develop leucopenia which cannot always be successfully corrected with medicinal agents. Therefore, there is a possibility of MRT use to promote hemopoesis, in particular leucopoesis in mammary cancer, lymphogranulomathosis, lymphoepithelioma, ovary cancer, hemangiopericitoma cases.

Clinical tests were carried out prior to and after the treatment. Prior to the treatment the average peripheral leukocyte value was 2.9 thousand, after the treatment it was 4.3 thousand. All the patients who had MRT were in position which allowed either to begin or to finish discontinued chemotherapy courses.

In malignancy, pain is known to be best treated when combined approach is used. Pain was noticed to increase with the disease progression. About one third of patients with metastatic cancer complain of pains and need analgetics. With the process expansion, pains appear in 60 to 90 per cent of cases.

Non-narcotic drugs are the medicinal agents of "the first line" for treatment of moderate pains. In cases with severe pains they can potentate effects of narcotic drugs. The use of non-narcotic drugs does not result in development of dependence, but they can produce a toxic effect on gastrointestinal tract and hematopoetic system. When they are ineffective, narcotic drugs are used.

The use of narcotic drugs leads to development of dependence, their repeated administration can result in drug "depot" formation and in severe respiratory disorders. Moreover, an absolute number of cancer patients, who need pain treatment, is growing increasingly. In this

connection. it becomes clear why the search for new nondrug pain treatment technique is getting urgent.

To alleviate pain, MRT was administered to patients with oncologic and nonmalignant diseases. Before MRT administration, 61% of patients assigned to MRT treatment group received analgetics in the form of tablets and injections, sleeping and narcotic drugs. After the treatment which consisted of 10 to 20 sessions, all patients either considerably reduced the drug dose or gave their drugs up. The analgetic effect as a rule, was developed immediately during the session and lasted for about 24 hours.

A long-term analgetic effect was observed after 2 to 3 MRT sessions. It was assessed according to its duration. We considered the effect to be a good one when pains were abated fully or partially for more than 10 days — up to 2 or 3 months. Satisfactory effect consisted in short-term cessation or relief of pain to 10 days. In some patients no pain relief was seen. The good effect was found in 85% of patients, satisfactory effect in 9% of cases, and in 6% of cases no effect was seen. Thus, in cancer patients an analgetic effect in one form or another was noticed in 94% of cases.

In the group of patients with non-cancer diseases (gastric ulcers, chronic gastritis, pancreatitis. mastopathy, intervertebral osteochondrosis, pelvic inflammatory diseases) who repeatedly received medicinal therapy, a long-term analgetic effects was obtained, which not uncommonly was accompanied by signs of the disease.

CHRONIC NONSPECIFIC PULMONARY DISEASES (CNPD)

They constitute a group of maladies which are pathogenically related, namely, chronic bronchitis, bronchiectasis, chronic abscess, chronic pneumonia, chronic obstructive emphysema, pneumofibrosis and pneumocirrhosis, interstitial diseases (V.V. Serov et al., 1987). The very listing of diseases evidences the impossibility of specific approaches to the treatment of a specific nosologic form. Here we are dealing with normalization of the lungs functions and their integrated systems irrespective of nosologic relationship of the pathologic proc-

ess. In other words, Quantum Medicine lacks an emphasized nosologic relation. The above does not contradict to well acclaimed antiinflammatory, antiedematic and other positive effects of microwave action. On the contrary, it is counteraction to some greatly nonspecific manifestations of a disease that underlies a specific physical method of treatment.

A variety of above mentioned acquired diseases of lungs is much related to their biological inducers among which fungi and parasites apart from bacteria and viruses can be found. The most widespread disease is chronic bronchitis which is caused by a prolonged irritation of bronchi by harmful agent such as smoking, inhaling of dust polluted air, smoke, carbon dioxide, sulfur dioxide, nitric oxide, and other compounds.

Incidence of chronic nonspecific diseases of lungs shows a distinct trend toward an increase. These diseases take the 3d or 4th place after cardiovascular diseases, malignant tumors, and injuries in a general pattern of morbidity, disability, and mortality in the majority of industrial countries. This is the cause of urgency in the control of this common illness.

A tremendous success in the treatment of CNPD has been achieved by Ukrainian scientists. L.P. Khimenko et al. (1992) note MRT high efficiency in patients with bronchospasm and make emphasis on a rather narrow range (566-58 GHz in 88% of cases) of therapeutic frequencies. In applying MRT for treatment of bronchospasm a curative effect is manifesting in relation to the main disease which was the cause of bronchospasmatic syndrome.

WITHDRAWAL SYNDROME IN OPIATE ADDICTS

Drugs' action on an organism is multidirectional. This complicates finding out the pathogenic links. Still, there are several main points that are worth mentioning.

– The majority of patients show addiction to drugs in youth which is an indication of psychological reasons of this age period.

– A drug-induced euphoria appears as a result of both therapeutic overdose and violation of the route of administration, e.g., intrave-

nous injections are changed for an intramuscular or peroral administration.

– Activation of detoxicating enzymes of liver, their effect on neuropeptide (endorphins, enkephalons) metabolism and the contents of cyclic nucleotides are vital for the pathogenesis of drug addiction (I.N. Pyatnitskaya, 1981).

– Interference of drugs, especially opiates, into the neuromediatory exchange at various functional and structural levels brings about a disorder in both the central nervous system (involving hypothalamus) and peripheral nervous system. Oxidation processes are inhibited and the functional activity of all the physiologic systems is reduced.

– Opiate addiction does not involve local injury mostly to one system or organ (I.N. Pyatnitskaya, 1981).

The above enumerated main mechanisms of opiate addiction development provide for a deeper evaluation of the principle of selection of one or another method of treatment. Even now we cannot provide details of the sanative effect mechanisms of the millimeter electromagnetic fields which inhibit the withdrawal syndrome in opiate addicts. S.A. Derendyayev et al. (1992) accentuate in outline considerable positive changes in neurohumoral regulation providing activation in ergotropic and trophotropic systems of those structural and functional agents which are responsible for neuropeptides production. In other worlds, there is a stimulation of the secretion of opiate peptides to balance disturbed homeostasis which is clinically similar to suppressing the withdrawal syndrome. By analyzing biochemical, neurophysiological, and psychological data the authors conclude that Quantum Medicine used as MRT permits the normalizing of the functioning of practically all the systems is an organism, namely nervous, enzymatic, hormonal, immune.

Specific sensory responses in this group of patients are also of interest. It is a specific character of the responses that is important, i.e., a psycho-emotional coloration of individual sensations. In particular, 70% of patients have comfortable sensations, such as a pleasant warmth and cripping which propagate over the whole body in a wav-

elike manner. In is to be noted that MRT simulates just those sensations which are felt after narcotic consumption.

The authors are quite right in the conclusion that these sensations, while felt under exposure to specific frequencies, are the result of adequate stimulation of ergotropic and trophotropic systems in those structural and functional agents which are responsible for neuropeptides production.

S.A. Derendyayev et al. (1989) studied blood of the patients prior and after the MRT treatment and during the treatment as well as for opioide peptide (m-encephalon), ACTH, cortisone, prolactine, endogenic ethanol and acetaldehyde. Following the first session of treatment there is observed a sharp increase in the content of m-encephalon and new level of functioning of neuropeptides is set up. The investigators conclude that millimeter electromagnetic radiation produces effect in opiate structures of the brain and take withdrawal as a specific metabolic stress that produces disorganization in the adaptation system.

MRT is effective when the time of treatment is considerably shorter and efficacy is by 1.5 to 2 times higher compared with that of medication, withdrawal is suppressed during 20 minutes from the beginning of the treatment, there are no side effects, and no need to sterilize instruments in the treatment of patients at high risk of AIDS and it can be used on an outpatient basis.

Special emphasis should be placed on economic efficiency of Quantum Medicine of drug addicts compared with that of medication. Calculations of economic efficiency of MRT in controlling drug addiction made by B.F. Rud'ko et al. (1989) evidenced that one generator of Г4-142 type used for the treatment of 180 patients per annum effects a saving of 15.4 thousand roubles. Nowadays, when people experience the most severe hyperinflation and, in particular, arise in the price of medicine, and furthermore when drug addiction manifests a leading increase, introduction of a new method of Quantum Medicine into medical practice has a great social and economic significance.

CHRONIC ALCOHOLISM

It is one of widespread forms of dependence. According to WHO, alcoholism is a compelled consumption of alcoholic beverages due to psychological and physical dependence with gradual increase in tolerance, an onset of dysfunctional states after an abrupt cessation of alcohol intake and, with an aggravation of this condition, development of psychic and somatoneurological disturbances. Incidence of alcoholism is within 3 to 6% percent of population in moderate and cold climatic zones (I.N. Pyatnitskaya, N.K. Permyakov, 1974).

Dependence of the patients' state on the presence or absence of alcohol in their organism is an important sign of the course of impairment. Withdrawal results in various ways, i.e., chill, midriasis, hyperhydrosis, tremor, hyperreflexia, ataxia, etc. The severity of the disorder is due to the fact that extensive-stage alcoholism results in patient's disability despite a prolonged abstinence of alcohol causes somatoneurologic, psychic, and social decompensation. Alcoholism is a cause of shortening life by 15 years on the average (I.N. Pyatnitskaya, N.K. Permyakov, 1974).

Therapeutic methods in store for treating alcoholism are numerous and variegated. These include disintoxicational, sedative, adrenolytic, cholinolytic, neuroleptic, antihistaminic agents and their combinations. In some cases advisable are: insulinization, compensation for nutritional deficiency, sensitization, etc. The art of this serious disorder healing is in finding the optimum mode of various pathogenic constituents of the disease affect since an isolated action upon one or another symptom provides for achievement of only temporary success.

MRT of chronic alcoholism can be considered, to a certain degree as a universal method of the disease treating because MRT effects all levels of the pathogenic process. S.P. Sit'ko et al. (1989) note that even after the first 20-minute session of BAT exposure to the therapeutic frequency of mm-range EHF reliable changes occur in reciprocal correlation among heart rhythm, levels of ethanol and acetaldehyde as well as the amount of m-encephalon and ACTH. Relations at

an intersystemic level, by the authors' evidence, become stable by the fifth session, while they are stabilized by the end of the treatment (the ethanol content in blood to that of reactive anxiety correlation ratio in the experimental group of patients prior to treatment was within $r = -0.098$, while after 10 sessions r was +0.58, $P<0.05$).

By summering the vast clinical experience of Hospital No. 21 in Kiev, V.A. Yudin et al., 1992 have come to a conclusion that MRT for chronic alcoholism makes it possible to increase the efficacy of treatment by 18% compared to current pharmaco-psychotherapeutic methods.

We have hereby discussed the potentialities of a new quantum physical approach to the control of some somatic and psychoneurological diseases in humans. In 1992, a group of researchers of SRC "Vidhuk" published in "Collection of Instructive Manuals and Legal Documents on Microwave Resonance Therapy" containing a more extensive number of diseases. These include purulent infections, neurodermites, acantholysis, chronic adnexitis, diabetic angiopathies, etc. There is an evidence that physicians from Kiev working for the "Vidhuk" Center arrested pain and relieved an exhausting itch in a patient with an acute generalized psoriasis who had been treated at top clinics of the USA and Argentina. Cases with other incurable diseases have occurred as well. No doubt conclusions should be made from a large amount of data but now we can as well surely say that in cases where conventional medicine is ineffective patients with incurable diseases apply for medical help for doctors practicing Quantum Medicine and many of them get substantial relief. It is to be understood that with developed atherosclerosis, cerebral hemorrhage or ischemic stroke, extremely acute dyskinesia with psychoemotional disorders and many other above mentioned pathologic states absolute judgments are wholly unacceptable. Here we have to be satisfied with partial results, and only for a limited period of time.

The MRT advantages does not consist in extremely low intensity of the latter but, mainly, in the fact that MRT is exclusively physiol-

ogic: it corresponds to natural characteristic parameters of an individual. That is why MRT has, virtually, no contraindication (clearly, providing proper selection of BAPs and operating conditions).

So, in Ukraine and some other countries, Quantum Medicine is becoming used on a wider scale in medical practice, i.e., it has left scientific laboratories. Strictly supervised and biomedical investigations do still require further details. With the majority of pathological states a conclusion is in order that the more serious an illness the more impressive an effect of MRT. Some researchers are inclined to believe that exposure to EHF electromagnetic radiation should not be combined with pharmaceutical therapy or other officially recognized methods of treatment. For unprejudiced significance of the available data, this position is unlikely to be trustworthy. The essence of the problem lies in the fact that normalizing of electromagnetic frame of the human body as a sole natural physiologic action would not correspond or combine with such essentially unnatural methods of treatment as chemotherapy (in a broad sense and not just pharmaceutical treatment of cancer patients), radiation therapy, etc. MRT have been repeatedly seen to drastically impair the general state of patients in beam therapy and interstitial radiotherapy. It is not impossible that beam therapy in the mW range is so disorganizing in reaction to the very feeble natural electromagnetic frame that exposure of BAPs to millimeter waves produces paradoxical effect against this background. In this context, the above presented concept has to be accepted.

As regards the combination of Quantum Medicine with various methods of official medicine in general, our view is that substantial corrections are registered since expedient treatment schedules and succession in their combinations are still far from being at hand.

In the second place, it worth to mention the authority of opinion upon MRT as a universal method of nonspecific therapy. In managing a developed disease MRT is a physiological method of pathological syndromes stopping having much in common despite different nosological forms. This, obviously, does not exclude organotrophy in terms of selecting BAPs to be effected and drawing up either stimulating or depressing schedules of treatment. MRT is multipurpose in that it

expressly normalizes wave functions of a human body independently on the specific nature of the pathologic process.

Strictly speaking the concept of a specific nature in medicine up to now has been problematic. The specific nature of even morphologic phenomena is disputed. For example, LE-cells, which were considered pathognomonic precisely for systemic lupus, appeared to be found with nephritis, some autoimmune and infectious diseases. Sometimes pathologists fare difficulties in differentiating granulomatous reaction with tuberculosis, syphilis, and other specific inflammations. The point is that a pulmonary granulomatous reaction is not a special property of an infection. Reactions of an organism are substantially adaptive, they are based on biological regularity which reflects the unity of an organism and environment. The majority of reactive processes, which constitute a morphofunctional basis of various diseases, progress on the principle of "automatic acts" that are specifically stereotypic.

A basis conclusion that in order at the end of this chapter consists in an urgent necessity of a wide-range use of MRT in medical practice. This is, mainly, due to the fact that with extensive-stage pathologic states, traditional medicine is at its capacity limits and only Quantum Medicine is capable of improving quality of patients' life.

Chapter 4

Preventive Aspects of Quantum Medicine

The provision of the high population health level should be based, first and foremost, on the diseases appearance prevention. Prevention can be classified as primary and secondary. The primary prevention is a system of medical, hygienic, social and other undertakings aimed at the diseases prophylaxis by elimination of the causes and conditions of their beginning and the secondary prevention is aimed at early revealing of pathologic states, prevention of relapses, complications and the diseases aggravations.

We shall consider a new approach toward diseases prevention starting from malignant tumors. This is one of the key problems in biology and medicine that is conditioned by a growing malignant tumors rate in comparison with a cardiovascular diseases rate. According to the WHO, 5 million people die of cancer and by 2,000 this number will increase to 8 million. Calculations made in highly developed countries show that by this time a number of cancer cases will raise more than twice. Cancer control obviously should not be limited only by improvement of surgery, radiation and drug therapy, potentialities of which are being exhausted. Hence, preventive oncology comes into peculiar topicality.

At present cancer prevention is carried out in two ways: sanitary and hygienic (the primary prevention), including a wide range of health-improvement measures, and clinical (the secondary prevention), providing the revealing of precancerous states during mass medical screenings. It is a large-scaled, interdepartmental long-term

problem. Experience which has been accumulated shows that these prophylactical screenings have an insignificant influence on the number of malignant tumor cases. Thus, it is necessary to improve the existing forms of malignant tumors prevention and to look for a radical departure from conventional practice of pathogenetic prophylaxis. The latter may be achieved by an influence on the key mechanisms of an antitumoral defense. We dwell on some of them.

A neoplastic tissue releases substances increasing blood coagulation. They were called "a tumor coagulating factor." The increase of blood coagulating system activity also depends upon neoplastic cells ability to release the substances decreasing a fibrinolytical activity.

By means of scanning electron microscopy we have revealed filaments on the neoplastic cells surface. They were connected neither with the cancer cells filopodia nor with fibrillar connective tissue formations. These filaments in their exterior evidence resembled the filaments in the thrombotic masses. Further investigations showed that with an addition of native blood into a human tumor tissue culture an abundant precipitation of the fibrin filaments took place on their surface (L.N. Mkrtchian, 1989, 1990).

The question arises: what is the biological utility of the fibrin precipitation at the cancer cells surface? It is common knowledge that fibrin is involved in the most diversified processes: inflammation, dystrophy, adhesion, thrombogenesis, etc. Thus it is felt that coating the cancer cells with fibrin at a very early stage of the malignant cells origination masks its specificity and serves as a peculiar kind of the neoplastic cells reaction of adaptation at the struggle of alive cells for their servival. To put it differently, a true pathologic process is hidden by imitation of a common general pathologic state.

The idea of anticoagulant therapy of the malignant tumors is not a new one. As a method of treatment of an advanced malignancy, it is directed only against thromboembolic complications. We believe that the application of fibrinolytic substances for a prophylactic purpose among the persons with a high blood coagubility risk may be such physiological step that will prevent the development of immunological tolerance to the neoplastic cells. The need for the blood fibrinolytic

system activization up is dictated also by the fact that the blood coagubility in people sharply increased in the last decades. We believe that this has played an important part in the malignant neoplasias becoming more frequent. In the Quantum Medicine context the question under consideration is the key question as soon as it is possible to normalize the blood coagulation potential by means of MRT without medicines, etc.

One more aspect of MRT application in preventive oncology have surfaced already, this is the activization of synthesis of such physiologically active substances as interferons (INF). Their inhibiting effect on the neoplastic cells division and the experimental tumors growth slowing down is revealed. Some therapeutic effect is noted also with lymphogranulomatosis, some malignant blood system diseases, malignant bone tumors, mammary gland carcinoma.

There exists a rather interesting theoretical prerequisite of the INF system stimulation advisability. It has turned out that many microorganisms, responsible for different human infectious disease, induce the interferon processing. Now as soon as the commonly encountered that human infectious diseases rate have sharply decreased there are strong grounds to believe that the ability to INF processing in people has been lowered.

The investigators of Research Oncological Center of Ministry of Public Health of Armenia (ROC MPHA) have obtained new data on the regulating effect of different origin INF on the immune response L.A. Kamalian, Z.P. Ter-Pogosian et al., 1989). Moreover, by means of scanning electron microscopy we have revealed a crude change in the neoplastic cell membrane and its viral activators under the INF effect. It looks as if it is holed, its intactness, i.e., autonomy is ruined. And what is more, the increase of INF production in the experimental animals have markedly prevented the malignant tumors development.

The prevention influence of MRT in oncology was revealed by following. In ROC MPHA there were carried out the experiments to reveal the MRT effect upon the transplanted tumor growth. They were conducted on the following strains: sarcoma-45, renal cell carcinoma (RA), Plyss limphosarcoma, Shvets lymphatic leukemia, Seidel hepa-

toma MRT was conducted in two series — therapeutic and preventive ones. The experiments were carried out on male albino rats, 100-120 g each (190 animals were used. The results are shown in Tables 1 and 2.

Table 1 The Impact of MRT on Transplanted Tumor Growth (Therapeutic Series)

Tumor Strain	Biologically Active Points (BAP)	% of Inhibition
Sarcoma-45 n-20	GI19 VB34	15.3
Renal cell carcinoma (RA) n-20	E35 VC15 VB39 GI19	15.0
Renal cell carcinoma (RA) n-20	Zusanli, GI 4, E36	21.2
Plyss lymphosarcoma p-20	TR10, VB39, P9	no effect, growth stimulation in some cases
Shvets lymphatic leukemia p-20	GI19, VB39, P9	no effect
Seidel hepatoma p-20	GI19	no effect

MRT was given 24 hours after transplantation during 3 days one minute daily with 2 days' interval and then repeated.

MRT was given during 3 days before transplantation, one minute daily and then 24 hours after the therapeutic course was initiated, as in the previous serie.

As it is obvious from the tables, the growth inhibition of sarcoma-45 and renal tumor (RA) up to 15% took place during the therapeutic course. In case of RA this value reached 21.2% with the use of MRT on GI4 and E36 points, what is an evidence of the greater

effectiveness of these BAPs (biologically active points) in comparison with the combination of points E35, VC15, VB39, GI19. Percent of tumor growth inhibition increased markedly when the preventive MRT was carried out beforehand. In case of sarcoma-45 it was 60%, in case of renal tumor RA — 40%, but in case of mammary gland tumor SSK — 63%.

Table 2 The Impact of MRT on the Inoculated Tumor Growth (Preventive Series)

Tumor Strain	BAP*	% of Inhibition
Sarcoma-45 n-20	RP9 TR9 RP9 GI9 VB-34	60
Renal cell carcinoma n-20	E35 VB39 VC15 GI19	40
SSK-mammary gland tumor n-20	F11 CV22 VG20	63
Plyss lymphosarcoma n-20	VG11 VB39 RP9	no effect, stimulation in some cases
Shvets lymphatic leukemia n-20	VB-24 VB-36	no effect
Seidel hepatoma	P11 G-14 j3	no effect

In case of Shvets lymphatic leukemia and Seidel hepatoma the effect of MRT wasn't ensuring both in the therapeutic and preventive series, and in some cases of Plyss lymphosarcoma even the stimulation of the malignant tumor growth was observed.

In cases of sarcoma-45 and renal tumor RA the peripheral blood was tested, the biochemical blood analysis was carried out, the indices of the peroxide oxidation of lipids (POL) in microsomes of liver and kidneys — one of the most important processes in the malignancy pathogenesis — were studied (Shukurian S.Z). Data of this test are

* French classification of BAPs.

summarized in Table 3. The high level of POL reduction was determined. POL reduction in liver and kidney microsomes promotes the normalization of these organs functioning as it provides the normal function of membranes. Therefore, the intoxication of the cancer carrier in organism decreases. It also seems to be of great importance that the biochemical investigation of peripheral blood of rats with renal cell carcinoma does not undergo considerable changes and is at the control values level. It may be evaluated as one of MRT safety criteria.

Table 3 Changes of the POL under the effect of MRT in Liver, Kidney and Tumor Tissue Microsomes in Cases of Sarcoma-45 and Renal Cell Carcinoma RA

Tumor Strain	Tissue	Ascorbat-dependent POL mn MDA/mg of protein			NADP-dependent POL nm MDA/mg of protein		
		control	prev. ser.	Therap. series	control	prev. ser.	Therap series
Sarcoma- 45	liver	23.1±1.4	14,6±1,0	14.6±0,6	29,0±0,6	15.8±1 0	21±4,2
	tumor	7,0±0.7	6,8±0.6	11.0±0.7	2.7±0,8	7,0±0,8	9±0,8
Renal carcinoma cell RA	liver	8,2±0,1	3,8±0,1		8,5±0.3	5.3±0,7	
	tumor	1,8±0,5	1,5±0,0		1,3±0,1	1.1±0.0	
	kidney	3,1±0,3	1,5±0,0		1.5±0,0	1,6±0.0	

These data correlate with the results of investigations, carried out on a small number of subjects, suffering from different neoplasias (20 persons) and on ten healthy subjects who agreed to receive MRT. MRT was provided with the help of the generator Г4-142 in a frequency range of 40-70 GHz during 7 days. 10-15 min. daily. It was shown that high enzymatic and nonenzymatic POL of patients with cancer, which had been four times higher than the normal level in erythrocyte membranes, had been considerably decreased after MRT course. It is worth to note the evident improvement of patients state, and in some cases, even the reduction in the focus of the disease after the use of MRT. Perhaps, the POL reduction is related with the analgetic effect of MRT, so far as pain, being a stress factor, promotes the

POL aggregation itself as one of the most important stress components. Capacity of MRT to reduce the POL level in erythrocyte membranes of patients and tissue microsomes of tumor carrier animals points to the possibility of its use as an antioxidant, which normalizes one of the main processes, providing maintenance of homeostasis.

The impact of MRT on the growth and progression of transplanted tumor Brown-Pierse was also studied. This model (male rabbits, 2.3-3.1 kg each) is usually used to study the growth of the tumor as well as its metastases. The data obtained allow to consider MRT to be an efficient mean for metastasis inhibition as well as for noticeable increase in a number of cells participating in complete phagocytosis.

At the Laboratory of Immunology and Virology two indices of the INF-status were determined in diseased and healthy persons: ability of the peripheral blood mononuclear cells, stimulated by PHA (phytohemaglutinin) to produce immune and γ-INF *in vitro* and the level of serous INF. Titration of the INF antiviral activity was carried out on the cells of a homologous line (pancreas carcinoma) in relation to the encephalomyocarditis virus of mice by a micromethod on the 96-hollows slab. By means of the spontaneous rosette test there was determined the T-cell general content (Eg-RFC) "active" T-cell subpopulation (Ea-RFC), the level and ratio of thophyllineresistent (Etr-RFC) to thophyllinesensitive (Ets-RFC) lymphocytes, reflecting the T-helpers and T-suppressors subpopulations ratio. It is evidence for the functional activity of monocytes taking into account their advesive ability according to test of cohesion to plastic

According to data obtained, the mean geometric titer of γ-INF was 120 U/ml in healthy persons. The significant increase of INF titers was also found in those of healthy subjects, who had a reduced INF level in blood (titers ranged from 80 to 240 U/ml). There was a recovery of mononuclear cells ability to process the immune INF, lymphokin, playing an important role in activation of nonspecific antitumor protection agents. At the same time MRT exerted an immune correction effect on T-lymphocytes parameters and functional activity of blood monocytes. The correlation was found between γ-INF proc-

essing and number of active T-lymphocytes. The immune correction degree depended on initial immune responsiveness state and individual adaptation.

The very interesting experiment on determination of tumor graft survival per cent and the tumor graft growth rates depending on MRT-action on a point GI-4 opposite to grafting site was planned by S.P. Sit'ko and carried out in the OSC of the Armenian Ministry of Health. The experiments were carried out in the Laboratory of Experimental Chemotherapy (the chief D.A. Galstian) with the participation of a senior research associate K.A. Alexanian.

Rat solid tumors — Worker's carcinoma and sarcoma-45 were used as test objects. Homogenated neoplastic material (0.3 ml) was injected in a point GI-4 on right anterior foot. Experimental animals were divided into 3 groups:

I — animals exposed to MRT once in a point GI-4 on left foot

II — animals exposed to a MRT 3 times on left foot

III — the controls

MRT was performed 2 minutes before grafting, during this process and for 2 minutes after tumor grafting. Animals with the same volume of neoplastic tissue subcutaneously grafted into subscapular area served as positive controls. There were 15 experimental animals in each group.

The experiments have shown that tumors in subscapular area developed on the 4^{th} day after grafting and were 1.3 cm^3 in size by the 8^{th} day (calculated according to Shreck-formula). At the same time, tumors were not found in the animals once exposed to MRT action, and in animals exposed to MRT action the tumor was revealed on the 8^{th} day and was of a lentil-bean size.

On the 14^{th} day the tumor growth was observed in all animals of the positive control group; the volume was 1.9 cm^3. In group of animals exposed to a single MRT action, the tumor growth was observed in only 2 cases, however, the growth was 3 times slower than in the positive control group — 0.6 cm^3.

In the group exposed 3 times to MRT action no tumors were found on the 12^{th} day. On the 21^{st} day the tumor volume was 2.4 cm^3

in the positive control group while in the group exposed to a single MRT action its volume equaled 1.2 cm^3.

Thus, being grafted into point GI-4, tumor appears 10 days later as compared with control group where tumor survival rate is 100%. On the 21st day tumor survival rate in animals exposed to a single MRT session was only 60%. The foot which was exposed to MRT in a point GI-4 was intact. These studies were controlled and repeated many times.

The main conclusion is that the experimental tumors grafted into the meridian grow slower and it is possible to prolong the latent period of tumor growth or to stop it completely when acting on the opposite BAP.

The Quantum Medicine conception opens up new avenues for the nonmedicamentous correction of different anticancer protection methods not only in experimental but also in clinical oncology (S.P. Sit'ko, L.N. Mkrtchian, 1990).

In 1989 in at RLD at ORC MH RA 360 patients with different diseases and syndromes systematized according to prior disease, its complications, and concomitant, background and competitive diseases, received MRT. 102 (28.3%) of 360 patients had different forms of precancer. Moreover, 65 patients (18.1%) predisposed to cancer were found using G.A. Abramian's method based on the BAP induction associated with INF-genie potency of a body. The hypothesis is that the quantum action prevents tumor cells from creating "their" coherent field and from reproducing and forming a tumor germ.

The total number of MRT session constituted 4419 (from 3 to 29 for each patient during a year). The majority of patients (275) received 10 to 15 MRT sessions. The data about 360 patients examined during period from January 1, 1988 to January 1, 1992 were entered into information array of the Armenian Cancer-register (PC "Spec"). A retrospective analysis is necessary to reveal patients with cancer among those who received MRT because of another disease. The information retrieval involved 14768 cases and during a 3-year period neither transformation of precancer into cancer nor malignancy were found (L.N. Mkrtchian, 1992).

Cancer incidence rate in population has no tendency to stabilization. At the end of 1990, 2.9 millions of people were registered in former Soviet Union that is 1.9% more than in 1989 (Barmina N.M., 1991). And what is more, the probability of cancer development is steadily increasing. During further life this increase for boys born in 1989 will be 20.2%, but for girls — 15.6% (E.M. Aksel, V.V. Dvoyrin, 1991).

It is evident that in the nearest future the mankind will not be able to moderate the ever increasing rate of technological progress and urbanization and so, to influence significantly the living condition of a modern man, and to limit his contact with environmental carcinogenic substances. From this the necessity of search for ways of increasing decreased human body antitumor resistance arises. We think that it is the best way to solve the cancer problem. The concept that "prevention" is the most desirable and economic way of solving cancer problem is heard more and more often at international conferences concerning problems of oncology. It is considered that in the nearest future the prevention will be the most effective method in cancer treatment.

However, this concept has not become material. We think that physiological processes must be responsible for germination, survival and progression of neoplastic germs. Such the processes include decrease of INF-genie body potencies, keilones inactivation (tissue-specific natural factors of cell reproduction suppression), the blood coagulability increase and decrease in cell factors activity associated directly of indirectly with antitumor resistance. We don't know other chemical or physical agents except MRT that may simultaneously stimulate the immune INF production, increase the number of natural killers-cytolytics, enhance the phagocytic activity of leukocytes and monocytes, decrease the blood coagulability, normalize POL and other metabolic processes. And above all the limiting and normalizing action of MRT on different pathogenetic mechanisms of the tumor growth is achieved mainly by physiological action.

No secret that people became drug dependent. Even the conception "a medicamentous man" appeared. Therefore, the development of

nonmedicamentous methods of action on main pathogenetic mechanisms of the antitumor protection is urgent. It is very important to know that the Quantum Medicine itself has no clastogenicity but on the contrary exerts the antimutagenic effect (L.N. Mkrtchian, A.K. Nersesian, 1993).

Supporting the body coordination and coherence the Quantum Medicine prevents autonomization of degenerating cells that is the most significant distinctive feature of the tumor growth. Moreover, according to Herbert Fröhlich conception, the transition of system from regulation to non-regulation is one of the main principles of the cellular tissue structures malignization.

Complex screening systems and routine methods of treatment did not change for the better cancer morbidity and mortality rates. A break-down and a true progress in oncology is necessary, which is possible only when fulfilling serious search work directed not only upon further improvement of existing surgical, radiological and chemotherapeutic methods of treatment but also upon development of non-traditional prevention and treatment methods.

The preventive role of Quantum Medicine in oncology and cardiovascular diseases has something general because of common risk factors. Besides, high blood coagulability may be considered as a risk factor not only in relation to myocardium infarction and thromboembolic insult but also in relation to malignant tumors. The decrease in total blood coagulation potential (fibrinogen, fibrinogen B, prothrombin, blood clotting time, thrombotest and so on) and also the decrease in thrombocytic aggregability more than by 30% under the influence of MRT were demonstrated both at OSC of the Ministry of Health of the Republic of Armenia and at SRC "Vidhuk". The anticoagulative MRT effect was exerted due to the thromboplastin formation decrease and also the normalization of fibrinogen quantity and fibrinolytic activity. Moreover, in most of patients at the end of the 3rd treatment course T.A. Kutsenko et al. (1989) found the recovery of the blood suspension stability necessary for normal microcirculation, the increase of antioxidant activity up by 40%, the decrease of POL level

and also the disappearance of vascular spasm and intravascular red blood cell aggregation.

Regarding the fact that during last decades the blood coagulability in man increased sharply, the Quantum Medicine ability to normalize the coagulation potential (to exert the anticoagulative action) becomes one of the most important mechanisms of the MRT sanation effect. Because of common nature of risk factors in cardiovascular and oncological diseases it is necessary to work out an integral approach to their prevention based on common pathogenetic mechanisms of development. So a special attention should be paid to the "system" withdrawal from disbalance, preventing severe complications such as vascular thrombosis of vitally important organs in practically healthy persons and to "the cover up" of malignant body cells other sedimentation of fibrin fibers on their surfaces.

Hyperfibrinogenemia may be latent for a long time without clinical manifestations. People with high fibrinogen level in peripheral blood feel themselves quite well and do not suspect danger.

Preventive MRT role may also be supported by the investigation carried out by A.S. Yanovskaya (1992). 65 children — "a risk group" — from a nursery school No. 346, Kiev, were followed-up. They have been often ill. The study of children's functional state has shown that they had T-cells, and T-killer cells deficiency and as a result were predisposed to different diseases. The increase in B-lymphocytes, T-helper and activated B-cells levels in blood reflects the presence of immunological process expressed insignificantly. The attention should be paid to the decrease in functional activity of all immunocompetent cells-lymphocytes and neutrophils, that may be reflected in the decrease of SDH and APase activity and increase of DNA content. High content of degraded neutrophils and cells with APase degranulation in neutrophils connected with phagocytosis of immune complexes also show the active immunological process.

The action of MRT (10 sessions, 5 min. each) on BAP E-36, GI-4 and on spleen point on ear caused recovery of lymphocytes population and subpopulation by 44-38% and the increase of lymphocytes and neutrophils functional states by 44-30%.

The correlative analysis of data under investigation made it possible to reveal the increase of interrelation between them. For example, DNA of T-suppressors correlates with that of T-lymphocytes; SDH of activated B-lymphocytes with that of O-lymphocytes, and the content of large lymphocytes correlates with DNA of B-lymphocytes. The correlation coefficient was 0.9-0.7. The data obtained allow to use MRT in somatically weakened children for prevention of diseases caused by immunodeficiency.

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The life itself makes it necessary to form a new branch of knowledge — "a healthy man clinic" which should comprise the diagnosis of risk situations and their treatment and to use new approaches to concepts of "norm and disease." The Quantum Medicine diagnosis is being more widely used, the first attempts are being made to computerize it. Unlike the blood and urine tests and other methods of diagnostics the Quantum Medicine will bring doctors closer to their patients. Diagnostician and therapeutist will be as one person at "a healthy man clinic."

We think that all general physicians must be able to use the acupuncture and MRT methods of diagnosis. Now in the West many high medical schools have departments and faculties for family physicians training. It is evident that this training must be based on up-to-date level of knowledge on etiopathogenesis, diagnose, prevention and treatment of diseases. At the same time it is necessary to introduce the course "The basis of Quantum Medicine" as an obligatory one at the departments and faculties for training family physicians considering the simplicity, availability, informativity and especially diversity of the method.

It is difficult for a modern physician to imagine a variety and complexity of syndromic diagnoses that prevailed in Oriental eastern medicine. Considering the fact that the conception "early" in clinical sense does not always correspond to "initial" in anatomical sense it is extremely urgent to find the non-traditional forms of pathological processes diagnosis long before their clinical manifestations. The ex-

perience gained allows to state that the asymptomatic, "scilent" diseases can be revealed using manual or instrumental acupuncture before the appearance of pain, other functional disorders and anatomical changes. It points to the fact that the disturbances of wave processes in meridians may appear long before the disease or its morpho-functional signs development.

All above stated is possible in prospect of medical science and practice when practically healthy people will become the object of study and a new branch of diagnostic, preventive and therapeutic knowledge will appear as "a healthy man clinic."

The people's health depends on many factors — socio-economic, behavioral, demographic, environmental, genetic, etc. Though the significant differences exist between the economically developed and developing countries there are also general features. The morbidity and mortality rate due to infections diseases steadily decreases but it increases due to other diseases. This refers first of all to the so-called chronic degenerative-proliferative diseases such as atherosclerosis and cancers (Kenneth G. et al., 1990). The risk of these diseases is connected with the increase of average lifetime and the negative action of environmental factors and urbanization.

It is known that in the Middle Ages the average lifetime was 30 years. It was the same up to 1800 and was considered to be the life border. The first significant change took place in 1900 when the average lifetime in Europe became 45 years. Lately it increased sharply: in some countries it is 79 years for women (somewhat lower for men). This sudden change took place in a very short historical period and not all body mechanisms of adaptation got time to develop. The specialists predict that in a hundred years middle age for women will be 100 years.

It is supposed that the accumulation and fixation of errors in a cell genome take place with age. The American geneticist L. Orgel brought up a hypothesis of photocopies. It looks as if we do a photocopy of a letter and then a photocopy of this photocopy and so on; the moment will come when a photocopy is quite indistinguishable. There are many reasons to state that with age the mechanisms supporting the

cell genome stability is weakened. Under these conditions the heredity conservatism is ruined and tissue flexibility activation necessarily takes place.

Cancer has two distinctive features compared with normal tissue. Firstly, a neoplastic cell doesn't mature with time, that is it doesn't become old. Being a new one it is reproduced without control and becomes aggressive. Secondly, this cell is autonomous and not influenced by correlative actions of integral body systems. For example, if a patient has a lipoma and does famine then normal fat burns (the body is provided with energy) but a fatty tumor itself continues to grow.

The theoretical basis of the Quantum Medicine discussed in Chapter 2 gave us possibility to study intimate mechanisms responsible for disintegration processes in a new way. Taking cancers as an example (to some extent it concerns also other diseases) it is easy to make sure that compensatory-adaptative processes have significantly weakened during last decades. It follows that their recovery is necessary. A medicamentous method for known reason is not optimal. The exposure of acupuncture points with its analgetic, myorelaxative, desensitizing, sedative, antipyretic and other effects directed on correction in homeostatic systems is often unstable and insufficiently expressed. It was found that combined use of drugs and acupuncture was undesirable in some cases (M.V. Nezhentsev et al., 1991). Moreover, these authors stated that during microelectrophoresis of drugs in acupuncture points (pharmacopuncture) their absorption from skin to internal body was not observed.

It follows that the orientation is necessary mainly not for arresting the symptoms of a diseases but for recovery of reduced body resistance before the development of a disease. In relation to cancer K. Stanley, J. Srjernword (1991) notes that there are 3 approaches to cancer treatment: prevention, early diagnosis and treatment. In most Western countries the answer to the question about the national policy in relation to cancer will be: "to find treatment." But the answer: "to prevent the cancer or to reveal it at early stage" is considered by authors to be more suitable. Lately, National Institutes of Health in

highly developed countries prefer the nonmedicamentous methods of the disease treatment and prevention. In the USA, for example, National Institute of Health uses screening for determination of cholesterol in peripheral blood and also lipoproteins of low and high density.

The achievements of medical science and their propagation by press and other mass media evoked great hopes in patients concerning rapid recovery from different diseases. If the disease lingered and had complications the physician in charge was considered guilty. Of course, during last decades the great progress in medicine was achieved but the most severe diseases do not go back and on the contrary acquire different character.

In conclusion we would like to say that in the nearest future just a prevention will have a great success when treating diseases in men. The scientifically grounded staged reorientation of health services is necessary. Its aim will be not to return to a patient's former state but to stabilize his health.

We think that the preventive principles of the Quantum Medicine may serve as infrastructural basis of the new services in the dynamic integrative system of public health in the 21st century. In future we will not be able to prevent radically the atherosclerosis, malignant tumors and other types of non-infectious pathology but probably we can low rates of their development.

In the course of time the fundamental idea of modern science — "Physics of the Alive," in our opinion, will become the theoretical basis for naturopathic methods of human diseases prevention and therapy improvement.

We are convinced that in nearest future quantum approaches will allow to draw near problem of superearly diagnosis of human diseases and by means of coherent electromagnetic field stabilization raise the general nonspecific resistance of organism to the various pathogenetic ecological factors.

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Supplement*

Summary Data of MRT Efficacy in Medical Practice According to Statistical Reports of 654 MRT-Rooms during 1990-93

No	WHO identification of disease	Disease (Nozological units)	Total No. of Cases	Including improvement	%%
		Blood diseases			
1.	401.9	Hypertonia	3448	3295	95.5
2.	463.0	Aterosclerosis	1623	1157	71.2
3.	454.0	Varicose veins (Trofic Ulcer)	2296	2148	93.5
4.	337.9	Vegetative dystonie	3212	3047	94.8
5.	414.8	Sciatica	2445	2342	95.7
6.	413.0	Neuro-circulatoric dystonie	3921	3803	97.0
		Rheumatoic diseases			
7.	716.0	Arthritis	5274	4331	82.1
		Respiratory diseases			
8.	439.9	Bronchial asthma	6967	6574	94.3
9.	466.0	Acute bronchitis	5978	5893	98 5
10.	491.2	Chronic brohchitis	11375	10986	96.6
11.	484.9	Pneumonia	1078	939	87.1
12.	477.9	Colds	2546	2396	94.1

* Prepared by L.L.Sumskoj

No	WHO identification of disease	Disease (Nozological units)	Total No. of Cases	Including improvement	%%
		Digestive diseases			
13.	535.5	Duodenitos	7038	6724	95.5
14.	535.1	Gastritis	6149	5586	90.8
15.	575.8	Gall-stone disease	2213	2167	97.9
16.	557.1	Colytos	1817	1723	94.8
17.	577.1	Pahcreatitis	1665	1608	96.5
18.	575.1	Cholecystitis	4272	4197	98.2
19.	531.7	Stomach Ulcer	1814	1648	90.8
20.	532.7	Duodenal Ulcer	20216	19779	97.8
		Urinary diseases			
21.	696.0	Pielonephritis	578	536	92.7
22.	606.1	Prostatitis	1347	1243	92.2
		Endocrinological and metabolical diseases			
23.	250.7	Diabetis mellitus	2388	2087	87.4
		Woman's diseases			
24.	614.0	Adhexitis	5576	5345	95.8
		Diseases of motor-support apparatus			
25.	715.0	Arthrosis	2716	2573	94.7
26.	730.2	Osteomyelitis	1618	1513	93.5
27.	733.4	Aseptic necrosis of infantile femoral head	1550	1550	100.0
		Nervous diseases			
28.	343.9	Infantile cerebral paralysis	22247	18372	82.6
29.	336.1	Myelopathy	2060	1911	92.7
30.	351.0	Neuralgia	7209	6805	83.0
31.	732.8	Osteochondrosis	21185	19948	94.4
32.	307.0	Incontinence of urine	7036	6421	91.2
		Mental diseases			
33.	291.0	Alcoholism	2889	2227	77.0
34.	304.0	Narcotism	1380	1085	78.6
35.	309.3	Neurastenia	1337	1218	91.1

No	WHO identification of disease	Disease (Nozological units)	Total No. of Cases	Including improvement	%%
		Skin disorderes			
36	691.8	Allergic dermatitis	1834	1712	93.3
37.	698.3	Neurodermitis	1526	948	62 1
38.	692.9	Psoriasis	1845	1573	85 2
39.	629.1	Eczema	3936	3600	90.7
		Others	64386	54948	90.0

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Summary Data of MRT Efficacy in Medical Practice According to Statistical Reports of 654 MRT-rooms during 1990-1993

Наукове видання

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